

THE GENUS *VELLEIA* SM.

R. C. CAROLIN

*University of Sydney*

(Plates I and II)

[Read 29th March, 1967]

*Synopsis*

A systematic treatment of the genus is provided. All species recognized are described, the types together with other specimens are cited. The following species are described as new: *V. glabrata* and *V. parvisepta*. A key for the identification of the species is given.

The genus *Velleia* is restricted to Australia and New Guinea so far as its distribution is known to date. The last complete treatment of the genus is due to Krause (1912) since which date there has been considerable collection and a revision has been found necessary. The main outlines of Krause's treatment remain intact except in his delimitation of the genus.

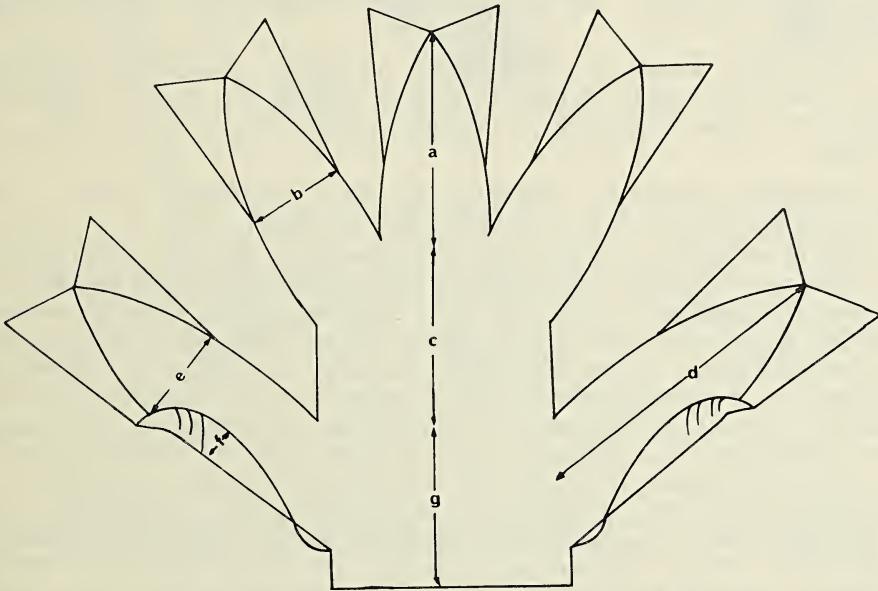


Fig. 1. Diagram of generalized expanded corolla of *Velleia* to show the various measurements given for each species. a, length of inferior lobe; b, breadth of inferior lobe; c, length of connate part of inferior lobes; d, length of superior lobe; e, width of superior lobe; f, width of auricle; g, length of tube.

*Velleia* can be recognized by its characteristic habit. The stem is distinct and elongated in two species in sect. *Euthales* but otherwise is usually very reduced and converted into a short caulorrhiza. From this stem arise peduncles bearing (usually) much branched dichasia. The inflorescence is thus a thyrses and the habit is derived directly from the characteristic *Goodenia* form (Troll, 1964; Carolin, 1967).

One series of measurements that requires explanation is that relating to the corolla. This is set out in Fig. 1.

The cytotaxonomy has been discussed previously and is known to be remarkably uniform throughout the genus with a basic number of eight

THE GENUS *VELLEIA* SM.

R. C. CAROLIN

*University of Sydney*

(Plates I and II)

[Read 29th March, 1967]

*Synopsis*

A systematic treatment of the genus is provided. All species recognized are described, the types together with other specimens are cited. The following species are described as new: *V. glabrata* and *V. parvisepta*. A key for the identification of the species is given.

The genus *Velleia* is restricted to Australia and New Guinea so far as its distribution is known to date. The last complete treatment of the genus is due to Krause (1912) since which date there has been considerable collection and a revision has been found necessary. The main outlines of Krause's treatment remain intact except in his delimitation of the genus.

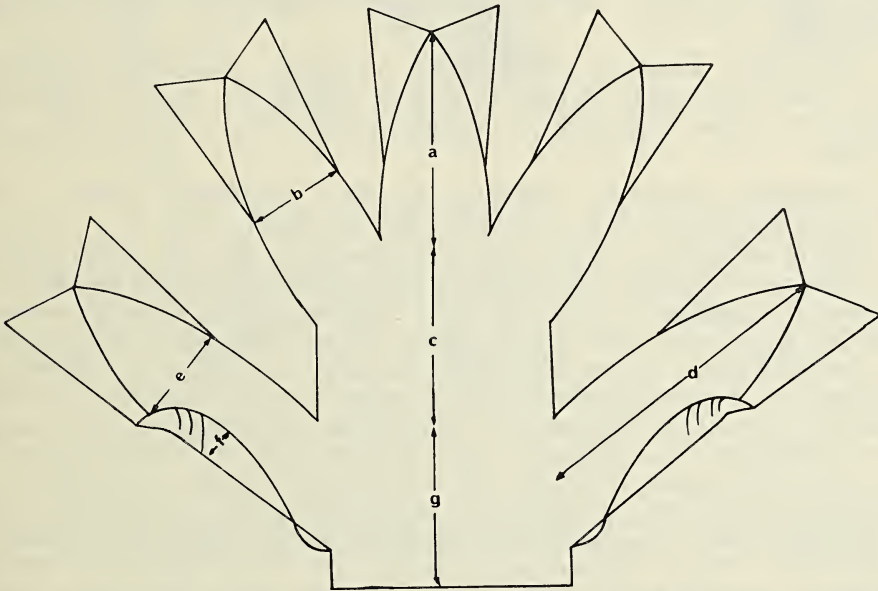


Fig. 1. Diagram of generalized expanded corolla of *Velleia* to show the various measurements given for each species. a, length of inferior lobe; b, breadth of inferior lobe; c, length of connate part of inferior lobes; d, length of superior lobe; e, width of superior lobe; f, width of auricle; g, length of tube.

*Velleia* can be recognized by its characteristic habit. The stem is distinct and elongated in two species in sect. *Euthales* but otherwise is usually very reduced and converted into a short caulorrhiza. From this stem arise peduncles bearing (usually) much branched dichasia. The inflorescence is thus a thyrses and the habit is derived directly from the characteristic *Goodenia* form (Troll, 1964; Carolin, 1967).

One series of measurements that requires explanation is that relating to the corolla. This is set out in Fig. 1.

The cytotaxonomy has been discussed previously and is known to be remarkably uniform throughout the genus with a basic number of eight



(Peacock, 1963). The voucher specimens indicated in Peacock's contribution are cited in the present work and indicated by an asterisk immediately following the herbarium location thus: "(SYD\*)".

A consideration of the floral anatomy and that of the seed and the relationships shown by these characters between *Velleia* and other genera in the family will be found in previous contributions (Carolin, 1959, 1966).

Of those species included in *Velleia* by Krause, only one has been excluded here, i.e., *V. cusackiana* F. Muell. The habit and inflorescence are clearly those of *Goodenia*; even Krause's description makes this clear.

#### VELLEIA Sm.

In *Trans. Linn. Soc. Lond.*, 4: 217 (1798); R.Br., *Prodr.*, 580 (1810); DC. *Prodr.*, 7: 518 (1839); De Vriese, *Gooden.*, 171 (1834); Hook. f., *Fl. Tasm.*, 1: t.68 (1860); Benth., *Fl. Austr.*, 4: 45 (1869); Benth. et Hook. f., *Gen. Plant.*, 7: 537 (1873); Schönland in *Engl. et Prantl., Pflzfm.*, 4: (5); 7 (1894); Bailey, *Fl. Qld.*, 892 (1900); E. Pritzel in *Engl. Bot. Jahrb.*, 35: 554 (1905); Krause, *Pflzrch., Goodeniaceae*, 27 (1912); Ewart, *Fl. Vict.*, 1066 (1931); Robertson in *Black, Fl. S. Austr.*, ed. 2, 4: 827 (1957); Curtis, *Student's Fl. Tasm.*, 2: 398 (1963).

*Orthographic variants*: *Velleya* Roem. et Schult., *Syst. Veg.*, 5: 5 (1819); Walp. *Ann.*, 1: 47 (1848); Moore et Betche, *Handb. Fl. N.S.W.*, 309 (1893); Rodway, *Fl. Tasm.*, 100 (1903). *Velleya* Schrad., *Neues Journ. Bot.*, 3(1): 118 (1890).

*Taxonomic synonyms*: *Euthales* R. Br.; *Menoceras* (R.Br.) Lindl. *Antherostylis* Gardner. See sections for full citations.

Annual or perennial herbs with a  $\pm$  persistent tap-root. *Stems* reduced to a branched or simple caulorrhiza often covered with dead leaf-bases; in two species elongated to 50 cm. tall. *Leaves* simple, spirally arranged, appearing as a rosette in most species. *Flowers* arranged in a series of dichotomous axillary cymes, each cyme borne on a usually elongated, erect ascending or prostrate peduncle naked except for the opposite bracteoles. *Sepals* 5 or 3, free from the ovary or the posterior one adnate for some distance at the midrib, free from each other or  $\pm$  connate. *Corolla* tubular at the base with an anterior spur or pocket and 5 lobes with lateral wings which are induplicate in the bud,  $\pm$  epigynous; 2 superior lobes usually more deeply cut than the rest,  $\pm$  auriculate. *Stamens* 5, free from each other but  $\pm$  epigynous. *Ovary* incompletely 2-locular with an incomplete  $\pm$  massive dissepiment bearing 4–c.20 ovules in two rows on either side: style simple: indusium sub-orbicular to oblong, curved or straight, usually ciliate, undivided: stigma notched or undivided. *Fruit* a 4- or 2-valved capsule, the latter often with 2-fid valves. *Seeds* few to several, compressed, winged or merely with a thickened rim. *Embryo* spatulate, embedded in endosperm.

*Type species*: *V. lyrata* R.Br.

#### Section EUTHALES, stat. nov.

*Basionym*: *Euthales* R.Br., *Prodr.*, 579 (1810); De Vriese, *Gooden.*, 169 (1854); DC., *Prodr.*, 7: 517 (1839).

Calyx united into a tube at least as long as the shortest lobes. Seeds punctulate with very narrow wing.

This small but well-defined group of species has a narrow distribution in the south-west of the continent. It is represented by one variable species occurring over most of that area (*V. trinervis*) and by two much more restricted species which appear to have rather narrower ecological tolerances.

(Peacock, 1963). The voucher specimens indicated in Peacock's contribution are cited in the present work and indicated by an asterisk immediately following the herbarium location thus: "(SYD\*)".

A consideration of the floral anatomy and that of the seed and the relationships shown by these characters between *Velleia* and other genera in the family will be found in previous contributions (Carolin, 1959, 1966).

Of those species included in *Velleia* by Krause, only one has been excluded here, i.e., *V. cusackiana* F. Muell. The habit and inflorescence are clearly those of *Goodenia*; even Krause's description makes this clear.

#### VELLEIA Sm.

In *Trans. Linn. Soc. Lond.*, 4: 217 (1798); R.Br., *Prodr.*, 580 (1810); DC. *Prodr.*, 7: 518 (1839); De Vriese, *Gooden.*, 171 (1834); Hook. f., *Fl. Tasm.*, 1: t.68 (1860); Benth., *Fl. Austr.*, 4: 45 (1869); Benth. et Hook. f., *Gen. Plant.*, 7: 537 (1873); Schönland in *Engl. et Prantl., Pflzfm.*, 4: (5); 7 (1894); Bailey, *Fl. Qld.*, 892 (1900); E. Pritzel in *Engl. Bot. Jahrb.*, 35: 554 (1905); Krause, *Pflzrch., Goodeniaceae*, 27 (1912); Ewart, *Fl. Vict.*, 1066 (1931); Robertson in *Black, Fl. S. Austr.*, ed. 2, 4: 827 (1957); Curtis, *Student's Fl. Tasm.*, 2: 398 (1963).

*Orthographic variants*: *Velleya* Roem. et Schult., *Syst. Veg.*, 5: 5 (1819); Walp. *Ann.*, 1: 47 (1848); Moore et Betche, *Handb. Fl. N.S.W.*, 309 (1893); Rodway, *Fl. Tasm.*, 100 (1903). *Velleya* Schrad., *Neues Journ. Bot.*, 3(1): 118 (1890).

*Taxonomic synonyms*: *Euthales* R. Br.; *Menoceras* (R.Br.) Lindl. *Antherostylis* Gardner. See sections for full citations.

Annual or perennial herbs with a  $\pm$  persistent tap-root. *Stems* reduced to a branched or simple caulorrhiza often covered with dead leaf-bases; in two species elongated to 50 cm. tall. *Leaves* simple, spirally arranged, appearing as a rosette in most species. *Flowers* arranged in a series of dichotomous axillary cymes, each cyme borne on a usually elongated, erect ascending or prostrate peduncle naked except for the opposite bracteoles. *Sepals* 5 or 3, free from the ovary or the posterior one adnate for some distance at the midrib, free from each other or  $\pm$  connate. *Corolla* tubular at the base with an anterior spur or pocket and 5 lobes with lateral wings which are induplicate in the bud,  $\pm$  epigynous; 2 superior lobes usually more deeply cut than the rest,  $\pm$  auriculate. *Stamens* 5, free from each other but  $\pm$  epigynous. *Ovary* incompletely 2-locular with an incomplete  $\pm$  massive dissepiment bearing 4–c.20 ovules in two rows on either side: style simple: indusium sub-orbicular to oblong, curved or straight, usually ciliate, undivided: stigma notched or undivided. *Fruit* a 4- or 2-valved capsule, the latter often with 2-fid valves. *Seeds* few to several, compressed, winged or merely with a thickened rim. *Embryo* spatulate, embedded in endosperm.

*Type species*: *V. lyrata* R.Br.

#### Section EUTHALES, stat. nov.

*Basionym*: *Euthales* R.Br., *Prodr.*, 579 (1810); De Vriese, *Gooden.*, 169 (1854); DC., *Prodr.*, 7: 517 (1839).

Calyx united into a tube at least as long as the shortest lobes. Seeds punctulate with very narrow wing.

This small but well-defined group of species has a narrow distribution in the south-west of the continent. It is represented by one variable species occurring over most of that area (*V. trinervis*) and by two much more restricted species which appear to have rather narrower ecological tolerances.



*Typification: Holotype*—*Euthales trinervis* (Labill.) R.Br., the only species described with the original genus description.

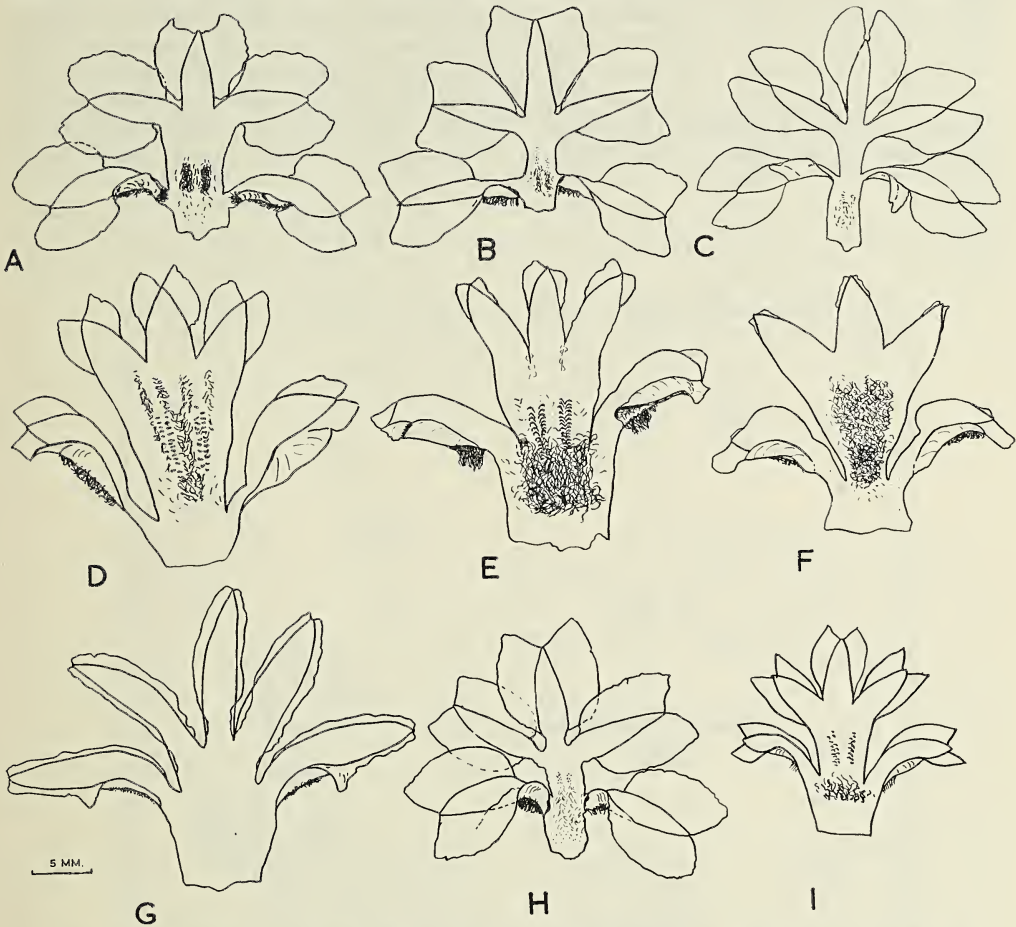


Fig. 2. Dissected corollas of *Velleia* sp. A, *V. trinervis*; B, *V. macrophylla*; C, *V. foliosa*; D, *V. daviesii*; E, *V. panduriformis*; F, *V. connata*; G, *V. discophora*; H, *V. rosea*; I, *V. arguta*.

#### 1. *V. TRINERVIS* Labill.

Nov. *Holl. Pl.*, 1: 54, t.77 (1804); Benth., *Fl. Austr.*, 4: 47 (1869); Krause, in *Pflrch.*, 54: 38 (1912).

*Nomenclatural synonyms*: *Euthales trinervis* (Labill.) R.Br., *Prodr.*, 580 (1810); DC., *Prodr.*, 7: 517 (1839); De Vriese, *Gooden.*, 169 (1854).

*Taxonomic synonyms*: *Velleia trinervis* var. *villosa* Benth., *Fl. Austr.*, 4: 47 (1869); *Euthales pilosella* De Vriese in *Lehm., Pl. Preiss.*, 1: 414 (1845)  $\equiv$  *Velleia pilosella* (De Vriese) Christensen et Ostenf. in *Dansk. Vidensk. Selsk. Biol. Medd.*, 3 (2): 122 (1921); *Velleia trinervis* var. *lanuginosa*, E. Pritzel in *Engl. Bot. Jahrb.*, 35: 556 (1905).

Perennial (?) herb with a stout tap root and short stout caulorrhiza obscured by the  $\pm$  persistent leaf-bases. *Leaves* arranged in an ascending to prostrate rosette on the caulorrhiza, linear to narrow-obovate or almost spathulate narrowing gradually towards the base into a linear petiole and broadening once more into a wide base, 5–20 cm. long (incl. petiole) 5–25 mm.



*Typification: Holotype*—*Euthales trinervis* (Labill.) R.Br., the only species described with the original genus description.

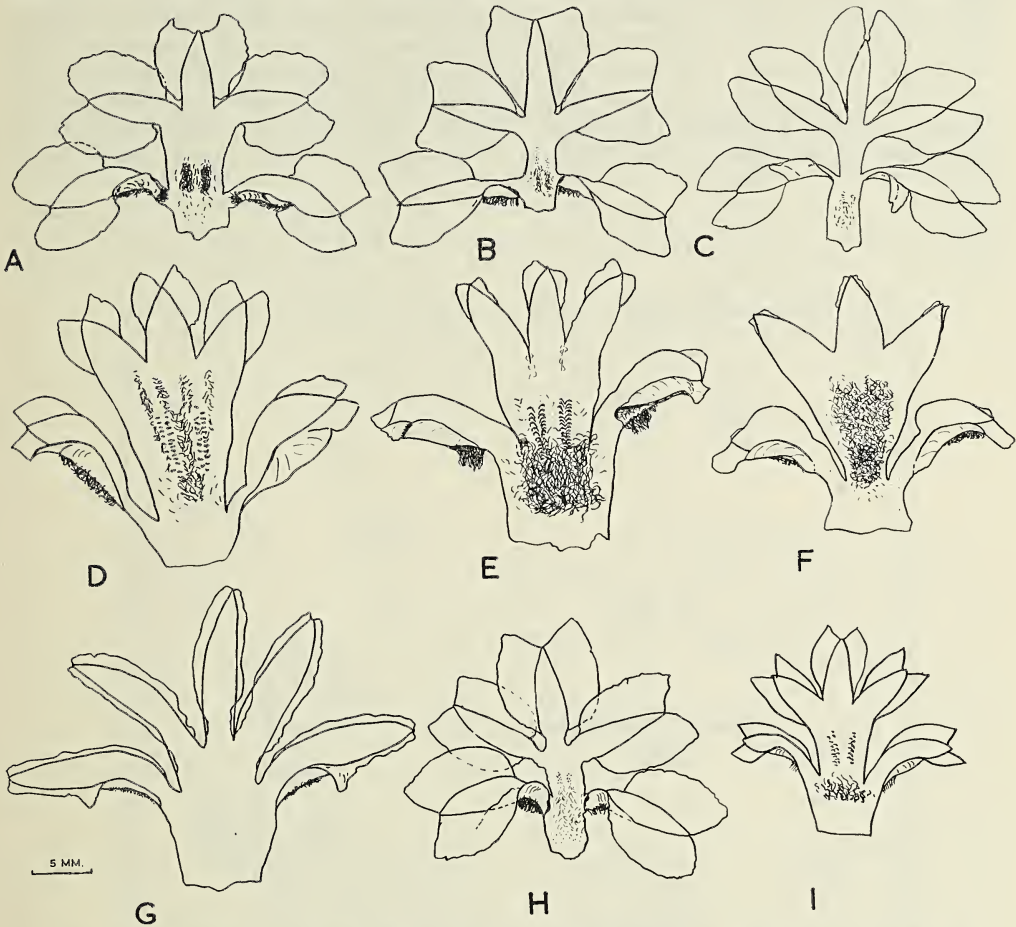


Fig. 2. Dissected corollas of *Velleia* sp. A, *V. trinervis*; B, *V. macrophylla*; C, *V. foliosa*; D, *V. daviesii*; E, *V. panduriformis*; F, *V. connata*; G, *V. discophora*; H, *V. rosea*; I, *V. arguta*.

### 1. *V. TRINERVIS* Labill.

Nov. *Holl. Pl.*, 1: 54, t.77 (1804); Benth., *Fl. Austr.*, 4: 47 (1869); Krause, in *Pflrch.*, 54: 38 (1912).

*Nomenclatural synonyms*: *Euthales trinervis* (Labill.) R.Br., *Prodr.*, 580 (1810); DC., *Prodr.*, 7: 517 (1839); De Vriese, *Gooden.*, 169 (1854).

*Taxonomic synonyms*: *Velleia trinervis* var. *villosa* Benth., *Fl. Austr.*, 4: 47 (1869); *Euthales pilosella* De Vriese in *Lehm., Pl. Preiss.*, 1: 414 (1845)  $\equiv$  *Velleia pilosella* (De Vriese) Christensen et Ostenf. in *Dansk. Vidensk. Selsk. Biol. Medd.*, 3 (2): 122 (1921); *Velleia trinervis* var. *lanuginosa*, E. Pritzel in *Engl. Bot. Jahrb.*, 35: 556 (1905).

Perennial (?) herb with a stout tap root and short stout caulorrhiza obscured by the  $\pm$  persistent leaf-bases. *Leaves* arranged in an ascending to prostrate rosette on the caulorrhiza, linear to narrow-obovate or almost spathulate narrowing gradually towards the base into a linear petiole and broadening once more into a wide base, 5–20 cm. long (incl. petiole) 5–25 mm.

wide, glabrous (at least when mature) to villous,  $\pm$  thick and fleshy dentate to entire or with blunt callous teeth,  $\pm$  obtuse, villous-woolly in the axils. *Peduncles* erect to ascending to 40 cm. tall,  $\pm$  terete, glabrous to villous. *Bracteoles* quite free or connate at the base into a very short tube (c. 1 mm. long), oblong to linear-deltoid, entire, glabrous to villous with some wool in the axils: lower ones 5–19 mm. long rarely longer: upper ones shorter. *Sepals* 5, connate into a tube 2–3 mm. long, attenuate towards the base, glabrous to densely villous on outside but always covered with long appressed villous hairs on inner surface: posterior lobe deltoid to ovate, 2–2.5 mm. long, 1.5 mm. wide,

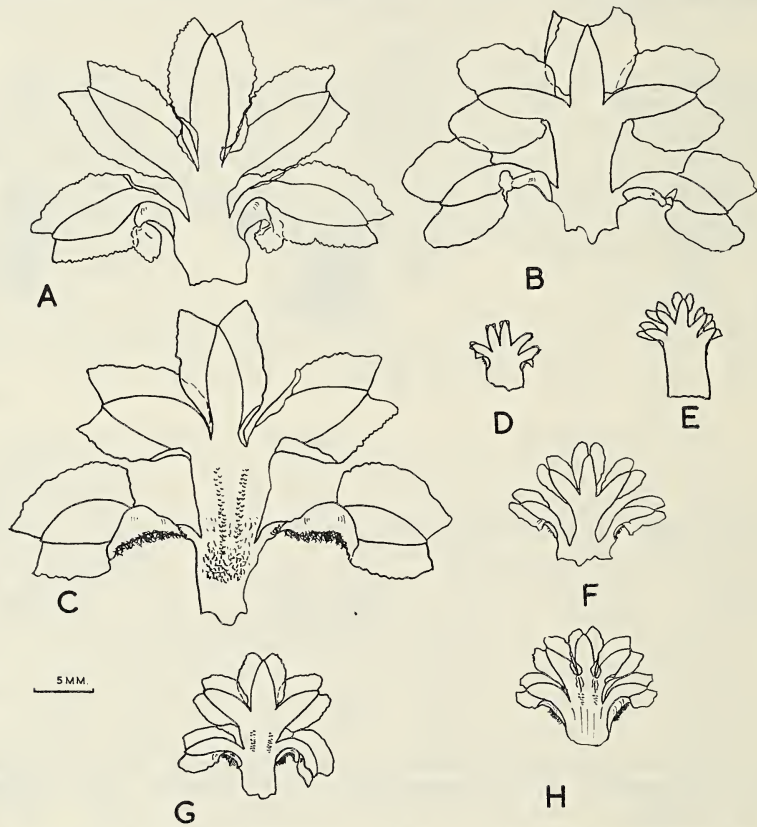


Fig. 3. Dissected corollas of *Velleia* sp. A, *V. paradoxa*; B, *V. glabrata*; C, *V. lyrata*; D, *V. spathulata*; E, *V. hispida*; F, *V. cynopotamica*; G, *V. montana*; H, *V. parvisepita*.

entire, acute rarely acuminate: other lobes only slightly smaller and narrower. *Corolla* yellow to orange with a red-brown throat, 8–12 mm. long with a very obscure anterior pocket adnate to about the mid-mark of the ovary, pubescent on outer surface, villous inside in the throat: tube 2.5 mm. long: superior lobes c. 6 mm. long and 1.5–2 mm. wide with broad (2 mm.) lateral wings and prominent auricles which are barbulate on their outer margin in the groove between auricle and lobe and on a callous at the base: inferior ones 4–5 mm. long, with broad lateral wings: connate part of inferior lobes 3–4 mm. long. *Stamens* 5, free: filaments linear-filiform, c. 2 mm. long: anthers linear to oblong, c. 1 mm. long. *Ovary* ovoid-globular, sprinkled with short-appressed hairs with a dissepiment not reaching the mid-mark and bearing c. 6 ovules: style  $\pm$  glabrous, c. 3 mm. long: indusium with a few hairs towards the base on the outer surface and rather more on the inner surface (but not a bunch), folded, curved, broad-obovate when flattened, c. 2 mm. wide



wide, glabrous (at least when mature) to villous,  $\pm$  thick and fleshy dentate to entire or with blunt callous teeth,  $\pm$  obtuse, villous-woolly in the axils. *Peduncles* erect to ascending to 40 cm. tall,  $\pm$  terete, glabrous to villous. *Bracteoles* quite free or connate at the base into a very short tube (c. 1 mm. long), oblong to linear-deltoid, entire, glabrous to villous with some wool in the axils: lower ones 5–19 mm. long rarely longer: upper ones shorter. *Sepals* 5, connate into a tube 2–3 mm. long, attenuate towards the base, glabrous to densely villous on outside but always covered with long appressed villous hairs on inner surface: posterior lobe deltoid to ovate, 2–2.5 mm. long, 1.5 mm. wide,

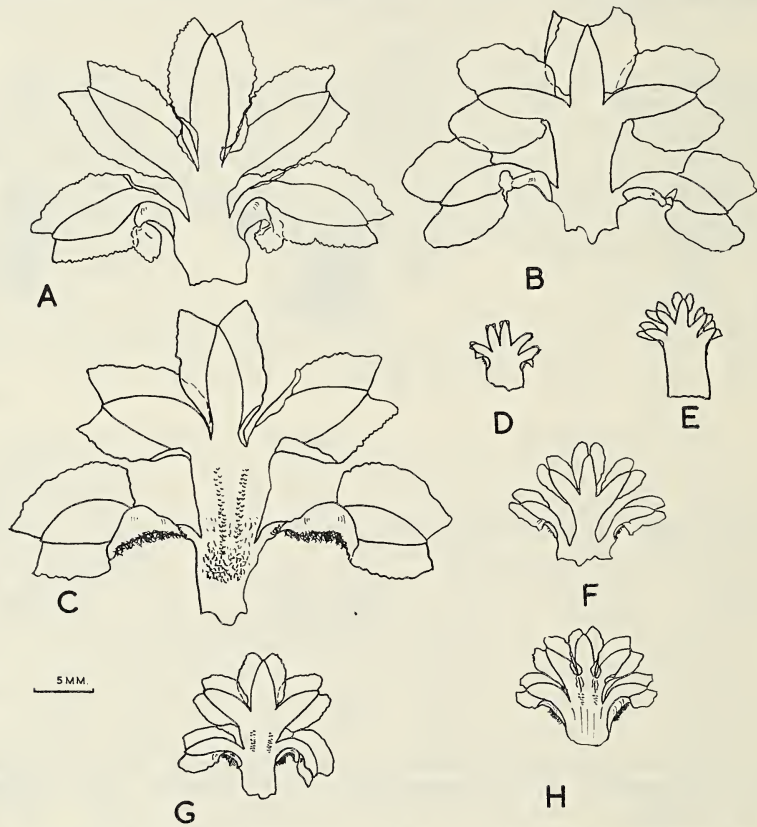


Fig. 3. Dissected corollas of *Velleia* sp. A, *V. paradoxa*; B, *V. glabrata*; C, *V. lyrata*; D, *V. spathulata*; E, *V. hispida*; F, *V. cynopotamica*; G, *V. montana*; H, *V. parvisepita*.

entire, acute rarely acuminate: other lobes only slightly smaller and narrower. *Corolla* yellow to orange with a red-brown throat, 8–12 mm. long with a very obscure anterior pocket adnate to about the mid-mark of the ovary, pubescent on outer surface, villous inside in the throat: tube 2.5 mm. long: superior lobes c. 6 mm. long and 1.5–2 mm. wide with broad (2 mm.) lateral wings and prominent auricles which are barbulate on their outer margin in the groove between auricle and lobe and on a callous at the base: inferior ones 4–5 mm. long, with broad lateral wings: connate part of inferior lobes 3–4 mm. long. *Stamens* 5, free: filaments linear-filiform, c. 2 mm. long: anthers linear to oblong, c. 1 mm. long. *Ovary* ovoid-globular, sprinkled with short-appressed hairs with a dissepiment not reaching the mid-mark and bearing c. 6 ovules: style  $\pm$  glabrous, c. 3 mm. long: indusium with a few hairs towards the base on the outer surface and rather more on the inner surface (but not a bunch), folded, curved, broad-obovate when flattened, c. 2 mm. wide



and 1 mm. long with a slightly curved orifice beset with long stiff cilia (c. 0.5 mm. long). *Capsule* ovoid, 7 mm. long, 4 mm. wide, glabrous or nearly so,  $\pm$  equally 4-valved. *Seeds* flat, orbicular, c. 2 mm. diam., minutely punctulate and with a thickened rim, yellow-brown.

*Range*: S.W. Province of S.W. Australia.

*Habitat*: Swamps and other damp places.

*Chromosome number*:  $2n = 16$  (Vouchers asterisked below).

*Typification*: *V. trinervis* Labill.—*Lectotype*—Habitat in terra van Leuwin—Labillardière, donated by Webb (P). *Isotypes*—ex Herb Maire (P): (Fi). *Euthales pilosella* De Vriese. Preiss no. 1438 (G.P.L.). *V. trinervis* var. *villosa* Benth. *Syntypes*—Drummond 4th coll. no. 188(K); King George's Sound, Collie (K); Vasse River, Oldfield (K); Don River and Cape Arid,



Fig. 4. Distribution of *Velleia trinervis* (●) and *V. discophora* (+).

Maxwell (K). *V. trinervis* var. *lanuginosa* E. Pritzel—*Holotype*—Crescit in distr. Avon pr. Mogumber in lutosi herbaceis humidioribus Diels no. 4038. (B, destroyed). *Goodenia tenella* Andr., Bot. Rep. 7: t.466 (1807) non R.Br. is a superfluous name since Andrews states “. . . & it is by Labillardière figured under the title of *V. trinervis*”.

*Discussion*: There is considerable variation within this species but none of the various character differences appear to be correlated consistently with each other. The colour of the petals varies from cream to orange, almost always with a brown colouration in the throat. The leaves vary from linear to broad-oblongate, the linear ones tending to occur west of the Darling Range and the broader ones in the more southerly parts of the distribution. The indumentum on the leaves has been made the basis for the erection of two varieties. There appear to be all gradations between villous and glabrous leaves and there seems little point in maintaining either at present. It differs from the rest of the species in this section in not having an elongated stem, and in the shorter, almost equal calyx-lobes.

and 1 mm. long with a slightly curved orifice beset with long stiff cilia (c. 0.5 mm. long). *Capsule* ovoid, 7 mm. long, 4 mm. wide, glabrous or nearly so,  $\pm$  equally 4-valved. *Seeds* flat, orbicular, c. 2 mm. diam., minutely punctulate and with a thickened rim, yellow-brown.

*Range*: S.W. Province of S.W. Australia.

*Habitat*: Swamps and other damp places.

*Chromosome number*:  $2n = 16$  (Vouchers asterisked below).

*Typification*: *V. trinervis* Labill.—*Lectotype*—Habitat in terra van Leuwin—Labillardière, donated by Webb (P). *Isotypes*—ex Herb Maire (P): (Fi). *Euthales pilosella* De Vriese. Preiss no. 1438 (G.P.L.). *V. trinervis* var. *villosa* Benth. *Syntypes*—Drummond 4th coll. no. 188(K); King George's Sound, Collie (K); Vasse River, Oldfield (K); Don River and Cape Arid,



Fig. 4. Distribution of *Velleia trinervis* (●) and *V. discophora* (+).

Maxwell (K). *V. trinervis* var. *lanuginosa* E. Pritzel—*Holotype*—Crescit in distr. Avon pr. Mogumber in lutosi herbaceis humidioribus Diels no. 4038. (B, destroyed). *Goodenia tenella* Andr., Bot. Rep. 7: t.466 (1807) non R.Br. is a superfluous name since Andrews states “. . . & it is by Labillardière figured under the title of *V. trinervis*”.

*Discussion*: There is considerable variation within this species but none of the various character differences appear to be correlated consistently with each other. The colour of the petals varies from cream to orange, almost always with a brown colouration in the throat. The leaves vary from linear to broad-oblongate, the linear ones tending to occur west of the Darling Range and the broader ones in the more southerly parts of the distribution. The indumentum on the leaves has been made the basis for the erection of two varieties. There appear to be all gradations between villous and glabrous leaves and there seems little point in maintaining either at present. It differs from the rest of the species in this section in not having an elongated stem, and in the shorter, almost equal calyx-lobes.



*Selected specimens examined: Western Australia:* East of Bremer Bay, T. E. H. Aplin no. 2761 (PERTH): Nth. Side of Mt. le Grand, A. S. George no. 2216, 12.12.1960 (PERTH): Near Cape Arid, Maxwell, 1875 (MEL 9660): S. of Grasspatch. Norseman-Esperance, J. H. Willis, 1.9.1947 (MEL 9691): King George's Sound, R. Brown no. 1802 (MEL 9677. NSW 75637. BM): Albany, R. Helms, Nov. 1896 (PERTH): Kalgan River S. of Stirling Range, R. Carolin no. 3480, 8.9.61 (SYD): Base of Mt. Toolbrunup, Stirling Range, T. E. H. Aplin no. 2060, 17.10.62 (PERTH): 1 ml. N. of Darnalup, B. G. Briggs, 5.10.60 (NSW 52413. SYD): Sources of Blackwood River—Cronin, 1888 (MEL 10011): Albany Highway, 300 mls. S. Perth, W. J. Peacock, 60878.3, 28.8.60 (SYD\*): Cranbrook, W. J. Peacock no. 60881-3, 26.8.60 (SYD\*): 1 ml. S. of Borden, W. J. Peacock, no. 60887-2, 31.8.60 (SYD\*): Pinjarra, C. A. Gardner no. 901, 16.8.1920 (PERTH): 4 ml. n. of Northcliffe on Quininup Rd., A. S. George no. 3180, 25.11.61 (PERTH): Manjimup, Max Koch no. 254, Nov. 1920 (PERTH. MEL 9699): Woorooloo, Max Koch no. 1568, 9.1906 (K. AD 96511154. NSW 75632. MEL 9658): District Swan, E. Pritzel no. 772, 10.1901 (AD 96511148. NSW 75628): Kelmscott, lower Canning River, A. Morrison no. 11139, 17.9.1902 (NSW 75623): Dinner Hill, c-30 ml. W. of Watheroo, R. Carolin no. 3392, 1.9.61 (SYD).

## 2. V. FOLIOSA (Benth.) Krause

In *Pflrch.*, 54: 40(1912).

*Nomenclatural synonym:* *V. macrophylla* var. *foliosa* Benth., *Fl. Austr.*, 4: 48(1869).

Perennial herb with stout  $\pm$  woody, glabrous, erect or ascending stem c. 5 mm. wide and up to 30 cm. tall. *Leaves* mostly spirally arranged and crowded (not distant)  $\pm$  coriaceous, narrow-obovate, tapering very gradually towards the base but sessile with a broad base, 4–7 cm. long (incl. base) 10–15 cm. wide, serrate especially towards the apex, acute, glabrous except for some wool in the axil. *Peduncles* erect or ascending up to 20 cm. tall, glabrous, terete. *Bractcoles* free, coriaceous with a few scattered villous hairs, usually entire, acute with a considerable amount of wool in the axils: lower ones narrow-ovate to elliptic or linear, rarely with a few teeth, up to 13 mm. long and 4 mm. wide: upper ones narrower, smaller, entire. Central flowers on pedicels up to 2.5 cm. long. *Sepals* 5, glabrous on the outer surface but with villous appressed hairs scattered over the inner surface, connate into a tube c. 3 mm. long tapering towards the base, acute, entire: posterior lobe ovate, c. 5 mm. long and 2.5 mm. wide, other lobes lanceolate to deltoid, c. 4 mm. long and 1 mm. wide. *Corolla* yellow to orange with a red-brown throat c. 12 mm. long with a very obscure anterior pocket, adnate to ovary to the mid-mark, pubescent outside but for the wings, pubescent inside in the throat, enations absent: tube 3 mm. long: superior lobes narrow-elliptic, c. 8 mm. long, 2–3 mm. wide with broad (2 mm.) lateral wings and prominent auricles which are barbulate both on the surface and the margin and have a small basal callus: inferior ones c. 6–8 mm. long and 3 mm. wide with a broad wing (2 mm. wide); connate part of inferior lobes 4–5 mm. long. *Stamens* 5, free; filaments  $\pm$  filiform, c. 2 mm. long: anthers oblong, c. 1 mm. long, apiculate. *Ovary* ovoid, pubescent, with a dissepiment not reaching to the mid-mark bearing c. 4 ovules: style glabrous, c. 2 mm. long: indusium slightly villous towards the base on outer surface and with a bunch of hairs on inner surface at base, folded, curved,  $\pm$  deltoid when flattened with a slightly curved orifice beset with long stiff cilia. *Capsule* ovoid-acuminate, c. 7 mm. long and 4 mm. wide, sprinkled with a few short fine appressed white hairs or almost glabrous,  $\pm$  equally 4-valved. *Seeds* flat, elliptic, c. 2 mm. long and 1 mm. wide including the obscure rim, minutely punctulate.



*Selected specimens examined: Western Australia:* East of Bremer Bay, T. E. H. Aplin no. 2761 (PERTH): Nth. Side of Mt. le Grand, A. S. George no. 2216, 12.12.1960 (PERTH): Near Cape Arid, Maxwell, 1875 (MEL 9660): S. of Grasspatch. Norseman-Esperance, J. H. Willis, 1.9.1947 (MEL 9691): King George's Sound, R. Brown no. 1802 (MEL 9677. NSW 75637. BM): Albany, R. Helms, Nov. 1896 (PERTH): Kalgan River S. of Stirling Range, R. Carolin no. 3480, 8.9.61 (SYD): Base of Mt. Toolbrunup, Stirling Range, T. E. H. Aplin no. 2060, 17.10.62 (PERTH): 1 ml. N. of Darnalup, B. G. Briggs, 5.10.60 (NSW 52413. SYD): Sources of Blackwood River—Cronin, 1888 (MEL 10011): Albany Highway, 300 mls. S. Perth, W. J. Peacock, 60878.3, 28.8.60 (SYD\*): Cranbrook, W. J. Peacock no. 60881-3, 26.8.60 (SYD\*): 1 ml. S. of Borden, W. J. Peacock, no. 60887-2, 31.8.60 (SYD\*): Pinjarra, C. A. Gardner no. 901, 16.8.1920 (PERTH): 4 ml. n. of Northcliffe on Quininup Rd., A. S. George no. 3180, 25.11.61 (PERTH): Manjimup, Max Koch no. 254, Nov. 1920 (PERTH. MEL 9699): Woorooloo, Max Koch no. 1568, 9.1906 (K. AD 96511154. NSW 75632. MEL 9658): District Swan, E. Pritzel no. 772, 10.1901 (AD 96511148. NSW 75628): Kelmscott, lower Canning River, A. Morrison no. 11139, 17.9.1902 (NSW 75623): Dinner Hill, c-30 ml. W. of Watheroo, R. Carolin no. 3392, 1.9.61 (SYD).

## 2. V. FOLIOSA (Benth.) Krause

In *Pflrch.*, 54: 40(1912).

*Nomenclatural synonym:* *V. macrophylla* var. *foliosa* Benth., *Fl. Austr.*, 4: 48(1869).

Perennial herb with stout  $\pm$  woody, glabrous, erect or ascending stem c. 5 mm. wide and up to 30 cm. tall. *Leaves* mostly spirally arranged and crowded (not distant)  $\pm$  coriaceous, narrow-obovate, tapering very gradually towards the base but sessile with a broad base, 4–7 cm. long (incl. base) 10–15 cm. wide, serrate especially towards the apex, acute, glabrous except for some wool in the axil. *Peduncles* erect or ascending up to 20 cm. tall, glabrous, terete. *Bractcoles* free, coriaceous with a few scattered villous hairs, usually entire, acute with a considerable amount of wool in the axils: lower ones narrow-ovate to elliptic or linear, rarely with a few teeth, up to 13 mm. long and 4 mm. wide: upper ones narrower, smaller, entire. Central flowers on pedicels up to 2.5 cm. long. *Sepals* 5, glabrous on the outer surface but with villous appressed hairs scattered over the inner surface, connate into a tube c. 3 mm. long tapering towards the base, acute, entire: posterior lobe ovate, c. 5 mm. long and 2.5 mm. wide, other lobes lanceolate to deltoid, c. 4 mm. long and 1 mm. wide. *Corolla* yellow to orange with a red-brown throat c. 12 mm. long with a very obscure anterior pocket, adnate to ovary to the mid-mark, pubescent outside but for the wings, pubescent inside in the throat, enations absent: tube 3 mm. long: superior lobes narrow-elliptic, c. 8 mm. long, 2–3 mm. wide with broad (2 mm.) lateral wings and prominent auricles which are barbulate both on the surface and the margin and have a small basal callus: inferior ones c. 6–8 mm. long and 3 mm. wide with a broad wing (2 mm. wide); connate part of inferior lobes 4–5 mm. long. *Stamens* 5, free; filaments  $\pm$  filiform, c. 2 mm. long: anthers oblong, c. 1 mm. long, apiculate. *Ovary* ovoid, pubescent, with a dissepiment not reaching to the mid-mark bearing c. 4 ovules: style glabrous, c. 2 mm. long: indusium slightly villous towards the base on outer surface and with a bunch of hairs on inner surface at base, folded, curved,  $\pm$  deltoid when flattened with a slightly curved orifice beset with long stiff cilia. *Capsule* ovoid-acuminate, c. 7 mm. long and 4 mm. wide, sprinkled with a few short fine appressed white hairs or almost glabrous,  $\pm$  equally 4-valved. *Seeds* flat, elliptic, c. 2 mm. long and 1 mm. wide including the obscure rim, minutely punctulate.

*Range*: Stirling Ranges, South-Western Australia.

*Habitat*: Hillside scrubs.

*Chromosome number*: Unknown.

*Typification*: *V. macrophylla* var. *foliosa* Benth.—*Lectotype*:—S.W. Australia, Drummond no. 192, 1848 (K.) *Isotypes*—(P. MEL 9736. NSW 75662).

*Discussion*: Differs from *V. macrophylla* principally in the sessile, crowded, coriaceous leaves and the shorter broader sepals, especially the posterior one. These two species differ from the remainder of the genus in having a consistently elongated stem.

*Selected specimens examined*: *Western Australia*. Warrengup, Stirling Range, B. G. Briggs, 8.10.60 (SYD): Warrengup Hill, Stirling Range, A. A. Dorrien-Smith (K): Stoney Places, Ross Peak, Stirling Range, C. A. Gardner, 7.12.34 (PERTH, K): Near top of Bluff Hill, A. S. George no. 3117, 12.11.61 (PERTH): Redgum Spring, Stirling Range, W. Rogerson, no. 54, Oct. 63 (PERTH).

### 3. *V. MACROPHYLLA* (Lindl.) Benth.

*Fl. Austr.*, 4: 47(1869): Krause in *Pflrch.*, 54: 40(1912).

*Taxonomic synonym*: *Euthales macrophylla* Lindl. in *Bot. Reg.*, 26: 54, t.119(1840): Maund, *Botanist*, t.209.

Perennial (?) herb to 20 cm. tall with erect or ascending  $\pm$  woody, glabrous stem about 5 mm. thick. *Leaves* distant, spirally arranged above but frequently opposite below, obovate to elliptic-obovate narrowing gradually into a linear petiole 5–14 cm. (incl. petiole) long, 5–35 mm. wide, serrate or dentate and frequently with a small mucro on the teeth, acute, glabrous on both surfaces except for some wool in the axil. *Peduncles* erect, up to 40 cm. tall, glabrous, terete, much branched. *Bracteoles* free, glabrous: lower ones lanceolate, up to 3 cm. long and 12 mm. wide, serrate or dentate, acute, almost sessile with some wool in the axils: upper ones narrower, less dentate and generally smaller. Central flowers on pedicels c. 25 cm. long. *Sepals* 5. connate into a tube c. 3 mm. long, attenuate towards the base, glabrous on the outer surface but with short scattered appressed  $\pm$  villous hairs on inner surface, entire: posterior lobe oblong to elliptic-narrow-obovate, 7 mm. long, 2.5 mm. wide, acute; other lobes 4 mm. long and narrower. *Corolla* yellow to orange with a reddish-brown throat, c. 12 mm. long with a very obscure anterior pocket adnate to mid-mark of ovary, pubescent outside and on inner surface in the throat: tube 2 mm. long: superior lobes narrow-oblong to narrow-elliptic c. 8 mm. long, 1.5 mm. wide broadly winged (c. 2.5 mm. wide) with a conspicuous auricle which is barbulate on the margin and has a basal callus: inferior ones 5–7 mm. long: connate part of inferior lobes 4 mm. long. *Stamens* 5, free: filaments  $\pm$  filiform, c. 2 mm. long: anthers oblong, c. 1 mm. long, not apiculate. *Ovary* ovoid, pilose, dissepiment not reaching to mid-mark and bearing 2–4 ovules; style glabrous, c. 2 mm. long: indusium folded and curved with a few scattered villous hairs towards the base on the outer surface and a bunch of hairs on the inner surface, deltoid to depressed obovate, 1 mm. long and 1.5 mm. wide with a slightly curved orifice beset with long stiff cilia. *Capsule* ovoid, c. 5 mm. long, 2–3 mm. wide, glabrous or with a few scattered white hairs, 4-valved but 2 of them frequently failing to part to the base giving the appearance of 3 valves. *Seeds* flat, elliptic, c. 4 mm. long and 2 mm. wide, with a very narrow margin, brown, minutely punctulate.

*Range*: South-western Australia. In the extreme South West: Warren River district, thus differing from *V. foliosa* in distribution (and probably habitat).

*Habitat*: Forest?



*Range*: Stirling Ranges, South-Western Australia.

*Habitat*: Hillside scrubs.

*Chromosome number*: Unknown.

*Typification*: *V. macrophylla* var. *foliosa* Benth.—*Lectotype*:—S.W. Australia, Drummond no. 192, 1848 (K.) *Isotypes*—(P. MEL 9736. NSW 75662).

*Discussion*: Differs from *V. macrophylla* principally in the sessile, crowded, coriaceous leaves and the shorter broader sepals, especially the posterior one. These two species differ from the remainder of the genus in having a consistently elongated stem.

*Selected specimens examined*: *Western Australia*. Warrengup, Stirling Range, B. G. Briggs, 8.10.60 (SYD): Warrengup Hill, Stirling Range, A. A. Dorrien-Smith (K): Stoney Places, Ross Peak, Stirling Range, C. A. Gardner, 7.12.34 (PERTH, K): Near top of Bluff Hill, A. S. George no. 3117, 12.11.61 (PERTH): Redgum Spring, Stirling Range, W. Rogerson, no. 54, Oct. 63 (PERTH).

### 3. *V. MACROPHYLLA* (Lindl.) Benth.

*Fl. Austr.*, 4: 47(1869): Krause in *Pflrch.*, 54: 40(1912).

*Taxonomic synonym*: *Euthales macrophylla* Lindl. in *Bot. Reg.*, 26: 54, t.119(1840): Maund, *Botanist*, t.209.

Perennial (?) herb to 20 cm. tall with erect or ascending  $\pm$  woody, glabrous stem about 5 mm. thick. *Leaves* distant, spirally arranged above but frequently opposite below, obovate to elliptic-obovate narrowing gradually into a linear petiole 5–14 cm. (incl. petiole) long, 5–35 mm. wide, serrate or dentate and frequently with a small mucro on the teeth, acute, glabrous on both surfaces except for some wool in the axil. *Peduncles* erect, up to 40 cm. tall, glabrous, terete, much branched. *Bracteoles* free, glabrous: lower ones lanceolate, up to 3 cm. long and 12 mm. wide, serrate or dentate, acute, almost sessile with some wool in the axils: upper ones narrower, less dentate and generally smaller. Central flowers on pedicels c. 25 cm. long. *Sepals* 5. connate into a tube c. 3 mm. long, attenuate towards the base, glabrous on the outer surface but with short scattered appressed  $\pm$  villous hairs on inner surface, entire: posterior lobe oblong to elliptic-narrow-obovate, 7 mm. long, 2.5 mm. wide, acute; other lobes 4 mm. long and narrower. *Corolla* yellow to orange with a reddish-brown throat, c. 12 mm. long with a very obscure anterior pocket adnate to mid-mark of ovary, pubescent outside and on inner surface in the throat: tube 2 mm. long: superior lobes narrow-oblong to narrow-elliptic c. 8 mm. long, 1.5 mm. wide broadly winged (c. 2.5 mm. wide) with a conspicuous auricle which is barbulate on the margin and has a basal callus: inferior ones 5–7 mm. long: connate part of inferior lobes 4 mm. long. *Stamens* 5, free: filaments  $\pm$  filiform, c. 2 mm. long: anthers oblong, c. 1 mm. long, not apiculate. *Ovary* ovoid, pilose, dissepiment not reaching to mid-mark and bearing 2–4 ovules; style glabrous, c. 2 mm. long: indusium folded and curved with a few scattered villous hairs towards the base on the outer surface and a bunch of hairs on the inner surface, deltoid to depressed obovate, 1 mm. long and 1.5 mm. wide with a slightly curved orifice beset with long stiff cilia. *Capsule* ovoid, c. 5 mm. long, 2–3 mm. wide, glabrous or with a few scattered white hairs, 4-valved but 2 of them frequently failing to part to the base giving the appearance of 3 valves. *Seeds* flat, elliptic, c. 4 mm. long and 2 mm. wide, with a very narrow margin, brown, minutely punctulate.

*Range*: South-western Australia. In the extreme South West: Warren River district, thus differing from *V. foliosa* in distribution (and probably habitat).

*Habitat*: Forest?



*Chromosome number*: Unknown.

*Typification*: *Euthales macrophylla*—*Lectotype*—(ex) Hort. Soc. Nat. Lond. Grown from seed purchased of James Drummond 1840 (CANTAB) Isotype (K).

*Discussion*: A species with a rather restricted distribution; differs from *V. foliosa* in the petiolate leaves and the narrower, longer posterior sepal. Their geographical distributions and ecological preferences also differ.

*Selected specimens examined*: *Western Australia*: Pemberton, T. E. H. Aplin, no. 1383, 11.12.61 (PERTH): Swan River, Drummond? no. 141, (K. MEL 9724): Swan River, Drummond, no. 189, (K. MEL 9731): Pemberton, Max Koch, Dec. 1920 (PERTH): Scott River, R. D. Royce, no. 74, 17.1.45. (PERTH): Big Brook, Warren Dist., Max Koch, no. 2256, (K. BRI 058787. NSW. MEL 9728) Bank of Big Brooks, Karri Dale, 1857 P. Walcott (MEL 9729).

#### Section MENOCERAS R.Br.

*Prodr.*, 580(1810): De Vriese, *Gooden.*, 172(1854).

*Nomenclatural synonyms*: *Euthales* sect. *Menoceras* (R.Br.) Steudel: *Menoceras* (R.Br.) Lindl., *Veg. Kingdom*, 695(1847).

*Taxonomic synonyms*: *Velleia* sect. *Aceratia* F. Muell. in *Trans. Phil. Soc. Vict.*, 1:18(1855): *Velleia* sect. *Pentasepala*, Krause, *Pflrch.*, 54: 28(1912): *Antherostylis* Gardner in *Journ. Roy. Soc. W. Austr.*, 19:91 (1934).

Sepals 5, free or connate, seeds winged or with a thickened margin.

*Typification*: sect. *Menoceras* R.Br.—*Lectotype*—*Velleia paradoxa* R.Br.: sect. *Aceratia* F. Muell.—*Holotype*—*Velleia connata* F. Muell: sect. *Pentasepala* Krause—*Lectotype*—*Velleia paradoxa* R.Br. Although *V. paradoxa* is selected as the lectotype, since Krause definitely states "n. sect" it appears that it cannot be accepted as a simple nomenclatural synonym of sect. *Menoceras*, *Antherostylis* Gardner—*Holotype*—*A. calcarata* Gardner.

#### 4. V. DAVIESII F. Muell.

*Fragm.*, 10:10(1876): Krause in *Pflrch.*, 54:39(1912).

Annual herb with a strong (?) tap root and very short caulorrhiza. *Leaves* all basal and arranged in an ascending rosette oblong to narrow elliptic in outline and narrowing very gradually towards the base into a linear petiole up to 20 cm. long (incl. petiole) and 2.5 cm. wide, lyrato-pinnatifid or incised below and dentate above, obtuse, pubescent when young but frequently glabrescent with maturity. Ciliate with villous wool in the axils. *Peduncles* erect or ascending, 20–40 cm. tall, pubescent,  $\pm$  ridged, up to 4 mm. diam. *Bracteoles* free or only connate at the base, very leafy, incised or dentate acute, pubescent with some villous hairs in axils; lower ones lanceolate to oblong or ovate, up to 4 cm. long and 1.5 cm. wide: upper ones smaller and narrower. *Sepals* 5, connate into a tube c. 2 mm. long, pubescent on both surfaces with yellowish hairs; posterior lobe broad-ovate, c. 10 mm. long, 4 mm. wide, with  $\pm$  long narrow teeth, acuminate; other lobes scarcely narrower and shorter but less dentate. *Corolla* lilac to white, up to 20 mm. long with a very obscure anterior pocket, adnate to ovary to below the mid-mark, pubescent on the outer surface, and with some long villous hairs on the inner surface particularly in the throat; tube c. 4 mm. long: superior lobes falcate-narrow-obovate, c. 15 mm. long and 3 mm. wide, winged with prominent (4 mm. wide) barbulate auricles: inferior ones obovate, 6 mm. long, 2 mm. wide with narrow wings near the apex. *Stamens* 5, free; filaments acuminate-deltoid, c. 3.5 mm. long: anthers oblong c. 3 mm. long. *Ovary* globular, pubescent with a dissepiment reaching to c. mid-mark bearing about 20 ovules, style covered with scattered villous hairs, 5 mm. long: indusium villous hairy,

*Chromosome number*: Unknown.

*Typification*: *Euthales macrophylla*—*Lectotype*—(ex) Hort. Soc. Nat. Lond. Grown from seed purchased of James Drummond 1840 (CANTAB) Isotype (K).

*Discussion*: A species with a rather restricted distribution; differs from *V. foliosa* in the petiolate leaves and the narrower, longer posterior sepal. Their geographical distributions and ecological preferences also differ.

*Selected specimens examined*: *Western Australia*: Pemberton, T. E. H. Aplin, no. 1383, 11.12.61 (PERTH): Swan River, Drummond? no. 141, (K. MEL 9724): Swan River, Drummond, no. 189, (K. MEL 9731): Pemberton, Max Koch, Dec. 1920 (PERTH): Scott River, R. D. Royce, no. 74, 17.1.45. (PERTH): Big Brook, Warren Dist., Max Koch, no. 2256, (K. BRI 058787. NSW. MEL 9728) Bank of Big Brooks, Karri Dale, 1857 P. Walcott (MEL 9729).

#### Section MENOCERAS R.Br.

*Prodr.*, 580(1810): De Vriese, *Gooden.*, 172(1854).

*Nomenclatural synonyms*: *Euthales* sect. *Menoceras* (R.Br.) Steudel: *Menoceras* (R.Br.) Lindl., *Veg. Kingdom*, 695(1847).

*Taxonomic synonyms*: *Velleia* sect. *Aceratia* F. Muell. in *Trans. Phil. Soc. Vict.*, 1:18(1855): *Velleia* sect. *Pentasepala*, Krause, *Pflrch.*, 54: 28(1912): *Antherostylis* Gardner in *Journ. Roy. Soc. W. Austr.*, 19:91 (1934).

Sepals 5, free or connate, seeds winged or with a thickened margin.

*Typification*: sect. *Menoceras* R.Br.—*Lectotype*—*Velleia paradoxa* R.Br.: sect. *Aceratia* F. Muell.—*Holotype*—*Velleia connata* F. Muell: sect. *Pentasepala* Krause—*Lectotype*—*Velleia paradoxa* R.Br. Although *V. paradoxa* is selected as the lectotype, since Krause definitely states "n. sect" it appears that it cannot be accepted as a simple nomenclatural synonym of sect. *Menoceras*, *Antherostylis* Gardner—*Holotype*—*A. calcarata* Gardner.

#### 4. V. DAVIESII F. Muell.

*Fragm.*, 10:10(1876): Krause in *Pflrch.*, 54:39(1912).

Annual herb with a strong (?) tap root and very short caulorrhiza. *Leaves* all basal and arranged in an ascending rosette oblong to narrow elliptic in outline and narrowing very gradually towards the base into a linear petiole up to 20 cm. long (incl. petiole) and 2.5 cm. wide, lyrato-pinnatifid or incised below and dentate above, obtuse, pubescent when young but frequently glabrescent with maturity. Ciliate with villous wool in the axils. *Peduncles* erect or ascending, 20–40 cm. tall, pubescent,  $\pm$  ridged, up to 4 mm. diam. *Bracteoles* free or only connate at the base, very leafy, incised or dentate acute, pubescent with some villous hairs in axils; lower ones lanceolate to oblong or ovate, up to 4 cm. long and 1.5 cm. wide: upper ones smaller and narrower. *Sepals* 5, connate into a tube c. 2 mm. long, pubescent on both surfaces with yellowish hairs; posterior lobe broad-ovate, c. 10 mm. long, 4 mm. wide, with  $\pm$  long narrow teeth, acuminate; other lobes scarcely narrower and shorter but less dentate. *Corolla* lilac to white, up to 20 mm. long with a very obscure anterior pocket, adnate to ovary to below the mid-mark, pubescent on the outer surface, and with some long villous hairs on the inner surface particularly in the throat; tube c. 4 mm. long: superior lobes falcate-narrow-obovate, c. 15 mm. long and 3 mm. wide, winged with prominent (4 mm. wide) barbulate auricles: inferior ones obovate, 6 mm. long, 2 mm. wide with narrow wings near the apex. *Stamens* 5, free; filaments acuminate-deltoid, c. 3.5 mm. long: anthers oblong c. 3 mm. long. *Ovary* globular, pubescent with a dissepiment reaching to c. mid-mark bearing about 20 ovules, style covered with scattered villous hairs, 5 mm. long: indusium villous hairy,



incurved at the margins but hardly folded, not curved, depressed obovate when flattened, c. 5 mm. wide with a slightly curved orifice beset with long cilia on outer lips and very short ones on inner lip. *Capsule* ovoid, c. 7 mm. diam., glabrous with a short mucro, 4-valved, the lateral splits slightly shorter than the antero-posterior ones. *Seeds* brown, orbicular, 4 mm. diam. including the broad (1 mm.) wing; body minutely punctulate and comma-shaped.

*Range*: Southern part of the salt lakes region of Western Australia.

*Habitat*: *Triodia* and probably scrub communities.

*Chromosome number*:  $2n = 16$ .

*Typification*: *V. daviesii* F. Muell.—*Holotype*—Prope Ularung, Young (MEL 9647).

*Discussion*: A distinct species differing from *V. connata* in the almost free bracts and wider corolla wings and from *V. paradoxa* and *V. arguta* in corolla colour.

*Selected specimens examined*: *Western Australia*: Frazer's Range, C. A. Gardner, no. 2912, 26.Oct.1931 (PERTH. K): 30 miles west of Ballidu, W. E. Blackall, no. 1213, 29.Oct.1931 (PERTH): 1 mile east of Woolgangie, Calaby, 2.11.1947 (CANB 15011): Southern Cross, E. Merrall, 1890 (MEL 9982): 45 miles S. of Brown's Soak, W. J. Peacock, no. 60870.1, 19.8.1960 (SYD\*): Coolgardie Goldfields, E. Pritzel, no. 850, 10.1901 (K.P. AD 96511150. NSW 75659).

##### 5. *V. PANDURIFORMIS* A. Cunn. ex Benth.

*Fl. Austr.*, 4: 46 (1869): Krause in *Pflrch.*, 54: 33 (1912): Ewart et Davies, *Fl.N.Terr.*, 263 (1917).

Annual (?) herb with a stout tap root and short caulorrhiza covered by persistent leaf-bases. *Leaves* arranged in an ascending rosette, obovate, dentate, shortly petiolate. *Peduncles* erect, glabrous, glaucous, terete, up to 1 metre tall, up to 4 mm. thick: at each node one of the lateral branches continues growth much more strongly than the other, giving a superficial appearance of a raceme of clusters. *Bracteoles* large, leafy, connate into a  $\pm$  funnel-like disk up to 12 cm. diam., frequently slit nearly to the base on one side, glabrous except for some short hairs in the axils, glaucous. Central flowers on pedicels up to 3 cm. long. *Sepals* 5, free or connate only at the base, pubescent on both surfaces, rarely almost glabrous outside, acute to acuminate, dentate: posterior one broad-elliptic, 15–18 mm. long, 8–10 mm. wide: others narrow-elliptic to lanceolate, 9–11 mm. long, 4–5 mm. wide. *Corolla* 20–25 mm. long, yellow, with a short broad anterior pouch, adnate to the ovary to about the mid-mark, glabrous to sparsely pubescent on the outer surface, villous on the inner surface at the throat with enations: tube 5–6 mm. long: superior lobes falcate-oblong, c. 10 mm. long and 3 mm. wide with a narrow (0.5 mm.) short wing on the upper margin and a large redoubled deep barbulate auricle c. 3 mm. wide: anterior lobes oblong to narrow-obovate 7–8 mm. long: 3–4 mm. wide with short narrow (1 mm.) wings: connate part of anterior lobes 8–9 mm. long. *Stamens* 5, free: filaments linear, 5 mm. long; anthers linear, 4 mm. long. *Ovary*  $\pm$  globular, glabrous or slightly pubescent with a swollen dissepiment scarcely reaching the mid-mark bearing c. 20 ovules: style sprinkled with long villous hairs, 7–9 mm. long: indusium transverse-oblong, 3 mm. long, 5 mm. wide, very sparsely villous to glabrous on both surfaces, slightly folded and curved with a slightly curved orifice beset with long white cilia on upper lip and shorter ones on lower lip becoming glabrous towards the centre. *Capsule* ovoid, 13–14 mm. long 10–12 mm. wide, glabrous or slightly pubescent,  $\pm$  equally 4-valved. *Seeds* orbicular, 8–9 mm. diam. including the broad wing (2 mm. wide), body slightly comma shaped, pale brown, minutely punctulate.

incurved at the margins but hardly folded, not curved, depressed obovate when flattened, c. 5 mm. wide with a slightly curved orifice beset with long cilia on outer lips and very short ones on inner lip. *Capsule* ovoid, c. 7 mm. diam., glabrous with a short mucro, 4-valved, the lateral splits slightly shorter than the antero-posterior ones. *Seeds* brown, orbicular, 4 mm. diam. including the broad (1 mm.) wing; body minutely punctulate and comma-shaped.

*Range*: Southern part of the salt lakes region of Western Australia.

*Habitat*: *Triodia* and probably scrub communities.

*Chromosome number*:  $2n = 16$ .

*Typification*: *V. daviesii* F. Muell.—*Holotype*—Prope Ularung, Young (MEL 9647).

*Discussion*: A distinct species differing from *V. connata* in the almost free bracts and wider corolla wings and from *V. paradoxa* and *V. arguta* in corolla colour.

*Selected specimens examined*: *Western Australia*: Frazer's Range, C. A. Gardner, no. 2912, 26.Oct.1931 (PERTH. K): 30 miles west of Ballidu, W. E. Blackall, no. 1213, 29.Oct.1931 (PERTH): 1 mile east of Woolgangie, Calaby, 2.11.1947 (CANB 15011): Southern Cross, E. Merrall, 1890 (MEL 9982): 45 miles S. of Brown's Soak, W. J. Peacock, no. 60870.1, 19.8.1960 (SYD\*): Coolgardie Goldfields, E. Pritzel, no. 850, 10.1901 (K.P. AD 96511150. NSW 75659).

##### 5. *V. PANDURIFORMIS* A. Cunn. ex Benth.

*Fl. Austr.*, 4: 46 (1869): Krause in *Pflrch.*, 54: 33 (1912): Ewart et Davies, *Fl.N.Terr.*, 263 (1917).

Annual (?) herb with a stout tap root and short caulorrhiza covered by persistent leaf-bases. *Leaves* arranged in an ascending rosette, obovate, dentate, shortly petiolate. *Peduncles* erect, glabrous, glaucous, terete, up to 1 metre tall, up to 4 mm. thick: at each node one of the lateral branches continues growth much more strongly than the other, giving a superficial appearance of a raceme of clusters. *Bracteoles* large, leafy, connate into a  $\pm$  funnel-like disk up to 12 cm. diam., frequently slit nearly to the base on one side, glabrous except for some short hairs in the axils, glaucous. Central flowers on pedicels up to 3 cm. long. *Sepals* 5, free or connate only at the base, pubescent on both surfaces, rarely almost glabrous outside, acute to acuminate, dentate: posterior one broad-elliptic, 15–18 mm. long, 8–10 mm. wide: others narrow-elliptic to lanceolate, 9–11 mm. long, 4–5 mm. wide. *Corolla* 20–25 mm. long, yellow, with a short broad anterior pouch, adnate to the ovary to about the mid-mark, glabrous to sparsely pubescent on the outer surface, villous on the inner surface at the throat with enations: tube 5–6 mm. long: superior lobes falcate-oblong, c. 10 mm. long and 3 mm. wide with a narrow (0.5 mm.) short wing on the upper margin and a large redoubled deep barbulate auricle c. 3 mm. wide: anterior lobes oblong to narrow-obovate 7–8 mm. long: 3–4 mm. wide with short narrow (1 mm.) wings: connate part of anterior lobes 8–9 mm. long. *Stamens* 5, free: filaments linear, 5 mm. long; anthers linear, 4 mm. long. *Ovary*  $\pm$  globular, glabrous or slightly pubescent with a swollen dissepiment scarcely reaching the mid-mark bearing c. 20 ovules: style sprinkled with long villous hairs, 7–9 mm. long: indusium transverse-oblong, 3 mm. long, 5 mm. wide, very sparsely villous to glabrous on both surfaces, slightly folded and curved with a slightly curved orifice beset with long white cilia on upper lip and shorter ones on lower lip becoming glabrous towards the centre. *Capsule* ovoid, 13–14 mm. long 10–12 mm. wide, glabrous or slightly pubescent,  $\pm$  equally 4-valved. *Seeds* orbicular, 8–9 mm. diam. including the broad wing (2 mm. wide), body slightly comma shaped, pale brown, minutely punctulate.



*Range*: Kimberley Region of Western Australia.

*Habitat*: Unknown.

*Chromosome number*:  $2n = 16$ . No voucher.

*Typification*: *V. panduriformis* A. Cunn. ex. Benth.—*Holotype*—Good-enough Bay and Point Cunningham, N.W. Coast, A. Cunningham (K)—*Isotypes* (BM. MEL 9640).

*Discussion*: Differs from *V. connata* in the obsolete calyx tube, pubescent calyx segments, larger flowers and the branching system of the scape in which one of the paired branches at each node shows much stronger growth than other and thus gives the appearance of a single, main axis.

*Selected specimens examined*: *Western Australia*: West Kimberley, G. F. Barnett, Aug.1936 (PERTH): Anna Plains Station, 80-mile Beach, N. T. Burbidge, no. 1426, 10.8.1941 (PERTH): Meda River, C. A. Gardner, no. 1624, 12.Oct.1921 (PERTH, NSW 75666): Near Derby, C. A. Gardner no. 9557a, 29 June 1950 (PERTH): Goody Goody, W. V. Fitzgerald, no. 236, April 1905 (PERTH): Mt. Anderson, West Kimberleys, K. Fitzgerald, no. 42, Aug. 1956 (CANB 38184): Fitzroy River, J. Forrest, 1883 (MEL 9645): Kajunje Station, D. W. Rust, 2K. Nov. 1954 (CANB 109410): 16 miles N.E. of Karunje Station, N. H. Speck, no. 5011, 14.9.1954 (CANB 47038. CANB 109409).

#### 6. *V. connata* F. Muell.

In *Trans. Phil. Soc. Vict.*, 1:18 (1855) et in *Hook. Kew Journ.*, 8:162 (1856): Benth., *Fl. Austr.*, 4:46 (1869): Moore et Betche, *Handb. Fl. N.S.W.*, 309 (1893): Bailey, *Qld. Fl.*, 3:893 (1900): Krause in *Pflrch.*, 54:33 (1912): Ewart et Davies, *Fl. N.Terr.*, 263 (1917): Ewart, *Fl. Vict.*, 1066 (1930): Robertson in Black, *Fl. S. Austr.*, ed. 2, 4:827 (1957).

*Taxonomic synonym*: *V. helmsii* Krause in *Pflrch.* 54:33 (1912).

Annual (?) herb with stout tap-root and short caulorrhiza. *Leaves* arranged in an ascending rosette, obovate to spatulate in outline narrowing basally into a short petiole, 5–20 cm. long (incl. petiole), 1.5–8.0 cm. wide, denticulate or dentate to lyrato-pinnatifid (the degree of dissection being extremely variable), obtuse, glabrous often glaucous, with a few short hairs in the axils. *Peduncles* ascending to erect, up to 60 cm. tall, glabrous, terete to slightly ridged, rarely showing a tendency for one branch to grow more strongly as in *V. panduriformis*. *Bracteoles* large, leafy, connate into a funnel up to 6 cm. diam. (usually c. 3 cm.) with a dentate margin, glabrous but for a few hairs in the axils. Central flowers on pedicels 2–7 cm. long. *Sepals* 5, connate into a tube 4–6 mm. long, glabrous, glaucous or pubescent outside with a few appressed hairs on the inner surface, acute to acuminate, entire to dentate: posterior one broad-ovate to ovate, 9–11 mm. long, 7–10 mm. wide: other lobes slightly smaller and narrower. *Corolla* yellow or brown yellow to white frequently with mauve markings, 15–17 mm. long with a short broad anterior pouch and adnate to the ovary to about the mid-mark, glabrous on the outer surface, densely villous on the inner surface with some enations: tube 2–3 mm. long: superior lobes falcato-narrow-obovate, 9–10 mm. long, 2.5 mm. wide with a narrow short wing on the upper margin and a broad (2.5 mm.) barbulate auriculate one on the lower margin: inferior lobes oblong 5–6 mm. long, 2 mm. wide with short narrow (less than 1 mm. wide) wings: connate part of inferior lobes 9–11 mm. long. *Stamens* 5, free: filaments linear, 4 mm. long: anthers linear 2.5 mm. long. *Ovary* ovoid, glabrous or nearly so with a swollen dissepiment reaching to about the mid-mark bearing 15–20 ovules: style sprinkled with long hairs in the upper half, 5 mm. long: indusium depressed obovate to transverse oblong, c. 4 mm. diam., slightly curved, slightly folded with a slightly curved orifice beset with long white bristles

*Range*: Kimberley Region of Western Australia.

*Habitat*: Unknown.

*Chromosome number*:  $2n = 16$ . No voucher.

*Typification*: *V. panduriformis* A. Cunn. ex. Benth.—*Holotype*—Good-enough Bay and Point Cunningham, N.W. Coast, A. Cunningham (K)—*Isotypes* (BM. MEL 9640).

*Discussion*: Differs from *V. connata* in the obsolete calyx tube, pubescent calyx segments, larger flowers and the branching system of the scape in which one of the paired branches at each node shows much stronger growth than other and thus gives the appearance of a single, main axis.

*Selected specimens examined*: *Western Australia*: West Kimberley, G. F. Barnett, Aug.1936 (PERTH): Anna Plains Station, 80-mile Beach, N. T. Burbidge, no. 1426, 10.8.1941 (PERTH): Meda River, C. A. Gardner, no. 1624, 12.Oct.1921 (PERTH, NSW 75666): Near Derby, C. A. Gardner no. 9557a, 29 June 1950 (PERTH): Goody Goody, W. V. Fitzgerald, no. 236, April 1905 (PERTH): Mt. Anderson, West Kimberleys, K. Fitzgerald, no. 42, Aug. 1956 (CANB 38184): Fitzroy River, J. Forrest, 1883 (MEL 9645): Kajunje Station, D. W. Rust, 2K. Nov. 1954 (CANB 109410): 16 miles N.E. of Karunje Station, N. H. Speck, no. 5011, 14.9.1954 (CANB 47038. CANB 109409).

#### 6. *V. connata* F. Muell.

In *Trans. Phil. Soc. Vict.*, 1:18 (1855) et in *Hook. Kew Journ.*, 8:162 (1856): Benth., *Fl. Austr.*, 4:46 (1869): Moore et Betche, *Handb. Fl. N.S.W.*, 309 (1893): Bailey, *Qld. Fl.*, 3:893 (1900): Krause in *Pflrch.*, 54:33 (1912): Ewart et Davies, *Fl. N.Terr.*, 263 (1917): Ewart, *Fl. Vict.*, 1066 (1930): Robertson in Black, *Fl. S. Austr.*, ed. 2, 4:827 (1957).

*Taxonomic synonym*: *V. helmsii* Krause in *Pflrch.* 54:33 (1912).

Annual (?) herb with stout tap-root and short caulorrhiza. *Leaves* arranged in an ascending rosette, obovate to spatulate in outline narrowing basally into a short petiole, 5–20 cm. long (incl. petiole), 1.5–8.0 cm. wide, denticulate or dentate to lyrato-pinnatifid (the degree of dissection being extremely variable), obtuse, glabrous often glaucous, with a few short hairs in the axils. *Peduncles* ascending to erect, up to 60 cm. tall, glabrous, terete to slightly ridged, rarely showing a tendency for one branch to grow more strongly as in *V. panduriformis*. *Bracteoles* large, leafy, connate into a funnel up to 6 cm. diam. (usually c. 3 cm.) with a dentate margin, glabrous but for a few hairs in the axils. Central flowers on pedicels 2–7 cm. long. *Sepals* 5, connate into a tube 4–6 mm. long, glabrous, glaucous or pubescent outside with a few appressed hairs on the inner surface, acute to acuminate, entire to dentate: posterior one broad-ovate to ovate, 9–11 mm. long, 7–10 mm. wide: other lobes slightly smaller and narrower. *Corolla* yellow or brown yellow to white frequently with mauve markings, 15–17 mm. long with a short broad anterior pouch and adnate to the ovary to about the mid-mark, glabrous on the outer surface, densely villous on the inner surface with some enations: tube 2–3 mm. long: superior lobes falcato-narrow-obovate, 9–10 mm. long, 2.5 mm. wide with a narrow short wing on the upper margin and a broad (2.5 mm.) barbulate auriculate one on the lower margin: inferior lobes oblong 5–6 mm. long, 2 mm. wide with short narrow (less than 1 mm. wide) wings: connate part of inferior lobes 9–11 mm. long. *Stamens* 5, free: filaments linear, 4 mm. long: anthers linear 2.5 mm. long. *Ovary* ovoid, glabrous or nearly so with a swollen dissepiment reaching to about the mid-mark bearing 15–20 ovules: style sprinkled with long hairs in the upper half, 5 mm. long: indusium depressed obovate to transverse oblong, c. 4 mm. diam., slightly curved, slightly folded with a slightly curved orifice beset with long white bristles



on the upper margin and shorter ones on the lower margin becoming nearly glabrous towards the middle. *Capsule* compressed-ovoid, c. 8 mm. diam., glabrous or nearly so and with a tiny mucro,  $\pm$  equally 4 valved. *Seeds* orbicular or broad-elliptic, 5–6 mm. diam. incl. the broad (1 mm.) wing: body slightly comma-shaped, brown-yellow, minutely punctulate: wing paler.

*Range*: Throughout the Eremaea south of the 20th parallel and into the Murray Valley.

*Habitat*: Mulga scrubs and hummock grasslands dominated by *Triodia* spp.

*Chromosome number*: Unknown.



Fig. 5. Distribution of *V. connata* (●) and *V. panduriformis* (+).

*Typification*: *V. connata* F. Muell.—*Holo(?)type*—Murray Scrub—F. Mueller (K). There is no specimen in MEL corresponding to this and it is assumed that the holotype was sent to, and retained by K. *V. helmsii* Krause—*Holotype*—Victoria desert, Camp 53. Helms (B. destroyed)—*Isotypes* (K. MEL 9628. NSW 75658).

*Discussion*: *V. helmsii* was recognized as being distinct from *V. connata* by virtue of its lacinate or dentate calyx lobes. This characteristic, however, is not consistently associated with any other. The type has pubescent calyx-lobes but this is found in few specimens of this group with lacinate calyx lobes. It seems, therefore, unreasonable to admit this variation to taxonomic rank.

*Selected specimens examined*: *Northern Territory*: No. 2 Desert Bore, Hamilton Downs, G. Chippendale, 20.9.1955 (NT 1669. CANB. 37978. BRI 008984. NSW 75607): 4 m. N. of Connor Well, C. Austr. G. Chippendale, 22.7.1958 (NT 4683): 20 miles south of the Granites, J. B. Cleland, 20.8.1936 (AD 96511024): 18 miles N.E. of Barrow Creek Township, M. Lazarides, no. 5823, 24.8.1956 (CANB 109403. CANB 55659. NT. PERTH. BRI 014356. MEL 9623. NSW 75612.K): *Queensland*. Charleville, E. W. Bick, Dec. 1916 (BRI

on the upper margin and shorter ones on the lower margin becoming nearly glabrous towards the middle. *Capsule* compressed-ovoid, c. 8 mm. diam., glabrous or nearly so and with a tiny mucro,  $\pm$  equally 4 valved. *Seeds* orbicular or broad-elliptic, 5–6 mm. diam. incl. the broad (1 mm.) wing: body slightly comma-shaped, brown-yellow, minutely punctulate: wing paler.

*Range*: Throughout the Eremaea south of the 20th parallel and into the Murray Valley.

*Habitat*: Mulga scrubs and hummock grasslands dominated by *Triodia* spp.

*Chromosome number*: Unknown.



Fig. 5. Distribution of *V. connata* (●) and *V. panduriformis* (+).

*Typification*: *V. connata* F. Muell.—*Holo(?)type*—Murray Scrub—F. Mueller (K). There is no specimen in MEL corresponding to this and it is assumed that the holotype was sent to, and retained by K. *V. helmsii* Krause—*Holotype*—Victoria desert, Camp 53. Helms (B. destroyed)—*Isotypes* (K. MEL 9628. NSW 75658).

*Discussion*: *V. helmsii* was recognized as being distinct from *V. connata* by virtue of its lacinate or dentate calyx lobes. This characteristic, however, is not consistently associated with any other. The type has pubescent calyx-lobes but this is found in few specimens of this group with lacinate calyx lobes. It seems, therefore, unreasonable to admit this variation to taxonomic rank.

*Selected specimens examined*: *Northern Territory*: No. 2 Desert Bore, Hamilton Downs, G. Chippendale, 20.9.1955 (NT 1669. CANB. 37978. BRI 008984. NSW 75607): 4 m. N. of Connor Well, C. Austr. G. Chippendale, 22.7.1958 (NT 4683): 20 miles south of the Granites, J. B. Cleland, 20.8.1936 (AD 96511024): 18 miles N.E. of Barrow Creek Township, M. Lazarides, no. 5823, 24.8.1956 (CANB 109403. CANB 55659. NT. PERTH. BRI 014356. MEL 9623. NSW 75612.K): *Queensland*. Charleville, E. W. Bick, Dec. 1916 (BRI



058745. NSW 75609. K): Gilruth Plains, Cunnamulla, G. H. Allen, 1.6.1942 (CANB 8187): *New South Wales*. Riverina, P. Kennedy, 12.1924 (NSW 75602): Upper Darling River, G. Day, 1878 (MEL 9638): Waratah, Enngonia via Bourke, T. V. Egan, 7.1921 (NSW75604): *South Australia*. Lone Gum near Berri, H. W. Andrew, 28.1921 (AD 96511023): Wilpena Pound, J. B. Cleland, 30.11.1933 (AD 96511023.K): *Western Australia*. 33 miles S.E. of Winduldu rockhole S.W. of Warburton, A. S. George no. 4002, Aug. 25. 1963 (PERTH): Beyond Marie and Alfred Ranges, Giles (MEL 9643 and 9644): 44 miles N. of Mundiwindi on Gt. N. Hwy., A. S. George (PERTH): Hammersley Range to Marillana Stn., N. T. Burbidge, no. 6015. 7.5.1958 (CANB 53757. PERTH):

#### 7. V. DISCOPHORA F. Muell.

*Fragm.*, 10:10 (1876); Krause in *Pflrch.*, 54:35 (1912).

Perennial herb with a stout tap-root and thick short caulorrhiza covered with dead leaf-bases. *Leaves* arranged in an ascending rosette, oblong to narrow-obovate in outline, tapering very gradually towards the base into a short linear petiole or almost quite sessile, up to 20 cm. long (incl. petiole) and 5 cm. wide, lyrato-pinnatifid and/or dentate (often coarsely so), acute, glabrous or glaucous with some short hairs in the axils. *Peduncles* ascending or erect, up to 80 cm. tall, glabrous, terete, up to 4 mm. wide, much branched. *Bracteoles* large, leafy, connate into a  $\pm$  disc like funnel, toothed or entire, glabrous, glaucous with some short hairs in the axils; lower ones with discs up to 5 cm. diam., upper ones smaller. Central flowers on pedicels up to 3 cm. long or sessile. *Sepals* 5, connate into a tube 2-3 mm. long, entire, acute, glabrous on both surfaces; posterior lobe lanceolate or narrow ovate, 5-6 mm. long, 2-5 mm. wide; other lobes narrow-lanceolate, c. 2 mm. wide. *Corolla* yellow 10-13 mm. long with an obscure anterior pocket, adnate to ovary to above the mid-mark, glabrous on the outer surface, villous (particularly in the throat) and with enations on the inner surface: tube c. 3-5 mm. long; superior lobes  $\pm$  oblong to narrow-obovate, falcate, 6 mm. long, 2 mm. wide, broadly (2 mm.) winged with conspicuous barbulate auricles; inferior ones oblong-elliptic, 2-4 mm. long, 2 mm. wide, broadly (1-2 mm.) winged: connate part of inferior lobes 4-5 mm. long. *Stamens* 5, free; filaments linear, 2 mm. long; anthers linear or narrow oblong, 2 mm. long, obtuse. *Ovary* sub-globular to ovoid, glabrous with a very short dissepiment bearing c. 12 ovules; style villous, c. 3 mm. long; indusium obovate to semi-orbicular, villous, folded, scarcely curved, c. 2-5 mm. wide, with an almost straight orifice beset with long, dense cilia on the upper lip and sparser very short ones on the lower lip. *Capsule* ovoid, c. 10 mm. long and 7 mm. diam., glabrous, shortly acuminate,  $\pm$  equally 4-valved. *Seeds* elliptic to  $\pm$  orbicular, c. 4 mm. wide incl. a pale yellow broad (1 mm.) wing; body pale brown to black, papillose.

*Range*: S.W. Margin of the Salt Lake country, Western Australia.

*Habitat*: Probably sandy or stony regions.

*Chromosome number*:  $2n = 16$ . (Vouchers are marked with an asterisk below.)

*Typification*: *V. discophora* F. Muell.—*Holotype*—Prope Ularung, Young, 10-15 Oct (MEL 9649).

*Discussion*: This species differs from *V. connata* principally in the narrow-ovate sepals, broader wings of the corolla lobes and the papillose seeds.

*Selected specimens examined*: *Western Australia*: Salmon Gums Research Stn., R. D. Royce, no. 4036, 17. April 1953 (PERTH): Near Gnarlbine, R. Helms, Elder Exped., 12.11.1891 (AD 96511015. MEL 9648. NSW 75654.K): 12 miles North of Lake Grace, P. R. Jeffries, no. 641030, Oct. 1964 (PERTH): Merredin, M. Koch, no. 2837, 10.1923 (NSW 75656.K): Coolgardie Goldfields,

058745. NSW 75609. K): Gilruth Plains, Cunnamulla, G. H. Allen, 1.6.1942 (CANB 8187): *New South Wales*. Riverina, P. Kennedy, 12.1924 (NSW 75602): Upper Darling River, G. Day, 1878 (MEL 9638): Waratah, Enngonia via Bourke, T. V. Egan, 7.1921 (NSW75604): *South Australia*. Lone Gum near Berri, H. W. Andrew, 28.1921 (AD 96511023): Wilpena Pound, J. B. Cleland, 30.11.1933 (AD 96511023.K): *Western Australia*. 33 miles S.E. of Winduldu rockhole S.W. of Warburton, A. S. George no. 4002, Aug. 25. 1963 (PERTH): Beyond Marie and Alfred Ranges, Giles (MEL 9643 and 9644): 44 miles N. of Mundiwindi on Gt. N. Hwy., A. S. George (PERTH): Hammersley Range to Marillana Stn., N. T. Burbidge, no. 6015. 7.5.1958 (CANB 53757. PERTH):

#### 7. V. DISCOPHORA F. Muell.

*Fragm.*, 10:10 (1876); Krause in *Pflrch.*, 54:35 (1912).

Perennial herb with a stout tap-root and thick short caulorrhiza covered with dead leaf-bases. *Leaves* arranged in an ascending rosette, oblong to narrow-obovate in outline, tapering very gradually towards the base into a short linear petiole or almost quite sessile, up to 20 cm. long (incl. petiole) and 5 cm. wide, lyrato-pinnatifid and/or dentate (often coarsely so), acute, glabrous or glaucous with some short hairs in the axils. *Peduncles* ascending or erect, up to 80 cm. tall, glabrous, terete, up to 4 mm. wide, much branched. *Bracteoles* large, leafy, connate into a  $\pm$  disc like funnel, toothed or entire, glabrous, glaucous with some short hairs in the axils; lower ones with discs up to 5 cm. diam., upper ones smaller. Central flowers on pedicels up to 3 cm. long or sessile. *Sepals* 5, connate into a tube 2-3 mm. long, entire, acute, glabrous on both surfaces; posterior lobe lanceolate or narrow ovate, 5-6 mm. long, 2-5 mm. wide; other lobes narrow-lanceolate, c. 2 mm. wide. *Corolla* yellow 10-13 mm. long with an obscure anterior pocket, adnate to ovary to above the mid-mark, glabrous on the outer surface, villous (particularly in the throat) and with enations on the inner surface: tube c. 3-5 mm. long; superior lobes  $\pm$  oblong to narrow-obovate, falcate, 6 mm. long, 2 mm. wide, broadly (2 mm.) winged with conspicuous barbulate auricles; inferior ones oblong-elliptic, 2-4 mm. long, 2 mm. wide, broadly (1-2 mm.) winged: connate part of inferior lobes 4-5 mm. long. *Stamens* 5, free; filaments linear, 2 mm. long; anthers linear or narrow oblong, 2 mm. long, obtuse. *Ovary* sub-globular to ovoid, glabrous with a very short dissepiment bearing c. 12 ovules; style villous, c. 3 mm. long; indusium obovate to semi-orbicular, villous, folded, scarcely curved, c. 2-5 mm. wide, with an almost straight orifice beset with long, dense cilia on the upper lip and sparser very short ones on the lower lip. *Capsule* ovoid, c. 10 mm. long and 7 mm. diam., glabrous, shortly acuminate,  $\pm$  equally 4-valved. *Seeds* elliptic to  $\pm$  orbicular, c. 4 mm. wide incl. a pale yellow broad (1 mm.) wing; body pale brown to black, papillose.

*Range*: S.W. Margin of the Salt Lake country, Western Australia.

*Habitat*: Probably sandy or stony regions.

*Chromosome number*:  $2n = 16$ . (Vouchers are marked with an asterisk below.)

*Typification*: *V. discophora* F. Muell.—*Holotype*—Prope Ularung, Young, 10-15 Oct (MEL 9649).

*Discussion*: This species differs from *V. connata* principally in the narrow-ovate sepals, broader wings of the corolla lobes and the papillose seeds.

*Selected specimens examined*: *Western Australia*: Salmon Gums Research Stn., R. D. Royce, no. 4036, 17. April 1953 (PERTH): Near Gnarlbine, R. Helms, Elder Exped., 12.11.1891 (AD 96511015. MEL 9648. NSW 75654.K): 12 miles North of Lake Grace, P. R. Jeffries, no. 641030, Oct. 1964 (PERTH): Merredin, M. Koch, no. 2837, 10.1923 (NSW 75656.K): Coolgardie Goldfields,









cowing, M. Koch, no. 1324, 9.1904 (AD 96511153. NSW 75638) : Coolgardie Road c. 7 miles S.W. of Kalgoorlie, D. Kemsley, 12.9.1951 (MEL 9804) : 19 miles N.N.E. of Kalgoorlie on Broad Arrow Rd., B. G. Briggs, 29.9.1960 (SYD. NSW 52433) : 20 miles South of Menzies near Kalgoorlie, R. Carolin, no. 3036 14.8.1961 (SYD) : Malcolm, C. A. Gardner no. 2480, 13. Aug. 1931 (PERTH) : 19 miles North of Agnew on road to Wiluna, T. E. H. Aplin, no. 2365, 19.8.63 (PERTH) : Laverton, J. H. Maiden, Sept. 1909 (NSW 75642. 75643) : 28 m. N. of Payne's Find, A. S. George, no. 685, 15.4 1960 (PERTH) : Yuin Stn. N.E. of Geraldton, W. J. Peacock, no. 60856.1, 15.8.1960 (SYD\*) : Old Bullardoo Station, W. J. Peacock, no. 60854.1, 16.8.1960 (SYD\*) : 3 miles E. of junction of Menzies-Mt. Magnet Rd., with rabbit proof fence no. 1, W. J. Peacock, no. 60872.2, 21.8.1960 (SYD\*) :

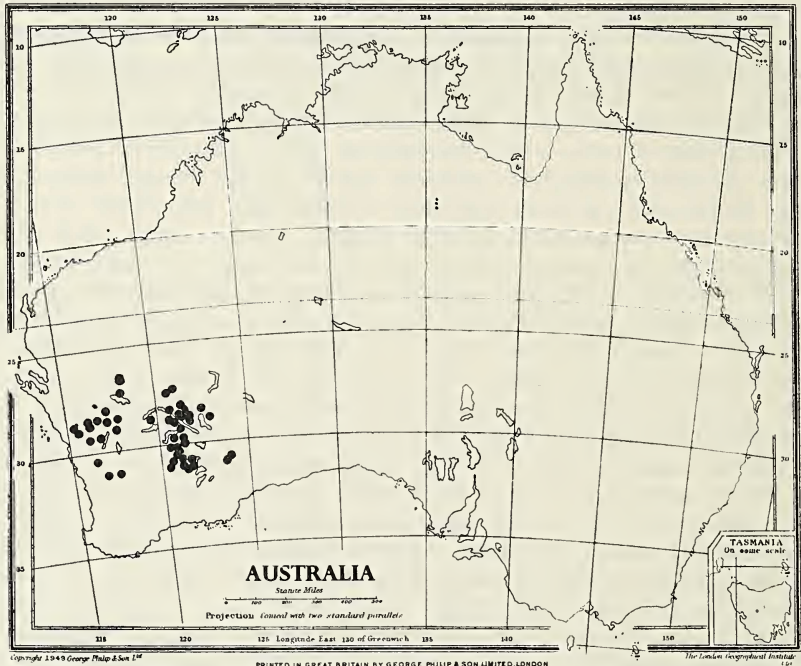


Fig. 6. Distribution of *V. rosea* (●).

#### 9. *V. CYCNOTOPAMICA* F. Muell.

*Fragm.*, 6:7 (1867) : Benth., *Fl. Austr.*, 4:48 (1869) : Robertson in *Black, Fl. S. Austr.*, ed. 2. 4:827 (1957).

Annual herb with a thin tap root and very short narrow caulorrhiza. *Leaves* arranged in an ascending to prostrate rosette, oblong to narrow-obovate or spatulate in outline narrowing towards the base into a linear or filiform petiole, 2–6 cm. long (incl. petiole), 3–10 mm. wide, conspicuously dentate to lyrate-incised or almost pinnatifid towards the base, obtuse, sprinkled with scattered villous hairs on both surfaces and with some villous hairs in the axils. *Peduncles* ascending, up to 25 cm. tall, terete, slightly pubescent with short  $\pm$  patent hairs or quite glabrous. *Bracteoles* free, pubescent and with villous hairs in the axils: lower ones very leafy, often deeply incised and toothed and  $\pm$  auriculate towards the base, oblong or narrow-ovate, up to 15 mm. long and 7 mm. wide, acute; upper ones smaller and less incised and toothed. Central flowers on pedicels up to 2 cm. long. *Sepals* 5, free or united only at the very bottom, acute, sprinkled with antrorse hairs, on both surfaces, ciliate but otherwise entire: posterior ones oblong to narrow-elliptic,

cowing, M. Koch, no. 1324, 9.1904 (AD 96511153. NSW 75638) : Coolgardie Road c. 7 miles S.W. of Kalgoorlie, D. Kemsley, 12.9.1951 (MEL 9804) : 19 miles N.N.E. of Kalgoorlie on Broad Arrow Rd., B. G. Briggs, 29.9.1960 (SYD. NSW 52433) : 20 miles South of Menzies near Kalgoorlie, R. Carolin, no. 3036 14.8.1961 (SYD) : Malcolm, C. A. Gardner no. 2480, 13. Aug. 1931 (PERTH) : 19 miles North of Agnew on road to Wiluna, T. E. H. Aplin, no. 2365, 19.8.63 (PERTH) : Laverton, J. H. Maiden, Sept. 1909 (NSW 75642. 75643) : 28 m. N. of Payne's Find, A. S. George, no. 685, 15.4 1960 (PERTH) : Yuin Stn. N.E. of Geraldton, W. J. Peacock, no. 60856.1, 15.8.1960 (SYD\*) : Old Bullardoo Station, W. J. Peacock, no. 60854.1, 16.8.1960 (SYD\*) : 3 miles E. of junction of Menzies-Mt. Magnet Rd., with rabbit proof fence no. 1, W. J. Peacock, no. 60872.2, 21.8.1960 (SYD\*) :

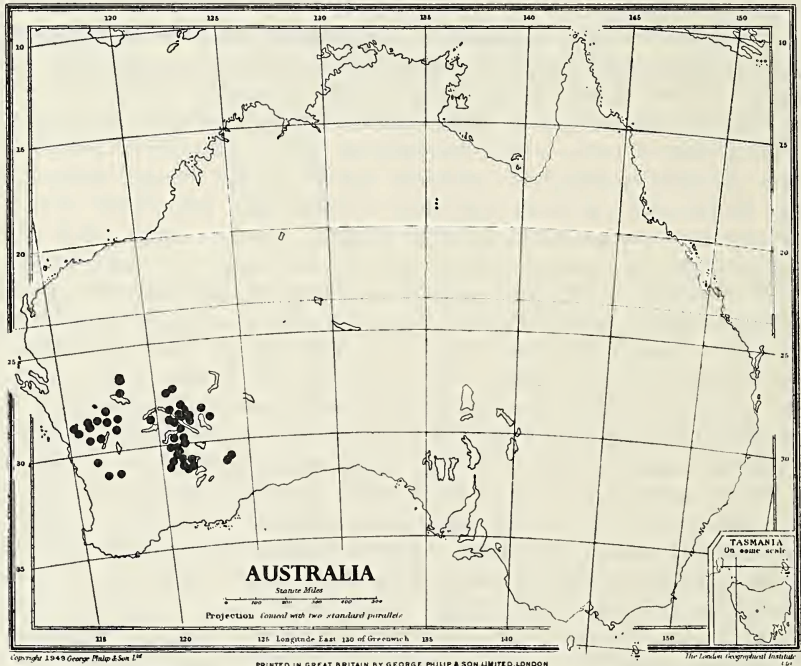


Fig. 6. Distribution of *V. rosea* (●).

### 9. *V. CYCNOTOPAMICA* F. Muell.

*Fragm.*, 6:7 (1867) : Benth., *Fl. Austr.*, 4:48 (1869) : Robertson in *Black, Fl. S. Austr.*, ed. 2. 4:827 (1957).

Annual herb with a thin tap root and very short narrow caulorrhiza. *Leaves* arranged in an ascending to prostrate rosette, oblong to narrow-obovate or spatulate in outline narrowing towards the base into a linear or filiform petiole, 2–6 cm. long (incl. petiole), 3–10 mm. wide, conspicuously dentate to lyrate-incised or almost pinnatifid towards the base, obtuse, sprinkled with scattered villous hairs on both surfaces and with some villous hairs in the axils. *Peduncles* ascending, up to 25 cm. tall, terete, slightly pubescent with short  $\pm$  patent hairs or quite glabrous. *Bracteoles* free, pubescent and with villous hairs in the axils: lower ones very leafy, often deeply incised and toothed and  $\pm$  auriculate towards the base, oblong or narrow-ovate, up to 15 mm. long and 7 mm. wide, acute; upper ones smaller and less incised and toothed. Central flowers on pedicels up to 2 cm. long. *Sepals* 5, free or united only at the very bottom, acute, sprinkled with antrorse hairs, on both surfaces, ciliate but otherwise entire: posterior ones oblong to narrow-elliptic,



c. 4 mm. long and 1.5 mm. wide; other ones scarcely shorter but slightly narrower. *Corolla* pink to white or bluish, 5–6 mm. long with an obscure anterior pouch, pubescent to almost glabrous on the outer surface, glabrous inside, enations absent, adnate to ovary to about mid-mark: tube 3 mm. long: superior lobes oblong to lanceolate c. 2 mm. long and almost 1 mm. wide, very narrowly winged with conspicuous auricles up to 1 mm. wide which are slightly barbulate and have a conspicuous membranous appendage: inferior ones oblong, 2 mm. long, 1 mm. wide with very narrow wings: connate part of inferior lobes c. 1 mm. long. *Stamens* 5, free; filaments filiform, 1–1.5 mm. long; anthers oblong, c. 0.5 mm. long, obtuse. *Ovary* globular, pubescent, with a very short dissepiment bearing c. 3 ovules: style glabrous, c. 1 mm. long: indusium incurved at the margins, straight, semi-orbicular, just less than



Fig. 7. Distribution of *V. cynopotamica* (●) and *V. hispida* (+).

1 mm. long, with a few villous hairs especially on the inner surface and with a  $\pm$  straight orifice beset with very short cilia. *Capsule* inflated-globular, c. 7 mm. diam., pubescent, 2-valved, each valve very rarely 2-fid (but see below!). *Seeds*, flat, orbicular, c. 3.5 mm. diam. incl. the broad wing (c. 1 mm. wide), the body wrinkled and distinctly comma-like.

*Range*: South Western Province of Western Australia and South Australia.

*Habitat*: Waste places, cultivated land, open country in general.

*Chromosome number*:  $2n = 16$ .

*Typification*: *V. cynopotamica* F. Muell.—*Holotype*—Ad flumen cygnorum. Drummond no. 410 (MEL 9798)—*Isotypes*—(P.G.).

*Discussion*: Differs from *V. rosea*, q.v., in the smaller corolla size and from *V. hispida*, q.v., most conspicuously in the pink to white rather than yellow petals.

*Selected specimens examined*: *South Australia*: Wudinna, C. W. Johns, no. 14, 1941 (AD 96511201). *Western Australia*: 8–10 miles east of Calingirrie.

c. 4 mm. long and 1.5 mm. wide; other ones scarcely shorter but slightly narrower. *Corolla* pink to white or bluish, 5–6 mm. long with an obscure anterior pouch, pubescent to almost glabrous on the outer surface, glabrous inside, enations absent, adnate to ovary to about mid-mark: tube 3 mm. long: superior lobes oblong to lanceolate c. 2 mm. long and almost 1 mm. wide, very narrowly winged with conspicuous auricles up to 1 mm. wide which are slightly barbate and have a conspicuous membranous appendage: inferior ones oblong, 2 mm. long, 1 mm. wide with very narrow wings: connate part of inferior lobes c. 1 mm. long. *Stamens* 5, free; filaments filiform, 1–1.5 mm. long; anthers oblong, c. 0.5 mm. long, obtuse. *Ovary* globular, pubescent, with a very short dissepiment bearing c. 3 ovules: style glabrous, c. 1 mm. long: indusium incurved at the margins, straight, semi-orbicular, just less than



Fig. 7. Distribution of *V. cynopotamica* (●) and *V. hispida* (+).

1 mm. long, with a few villous hairs especially on the inner surface and with a  $\pm$  straight orifice beset with very short cilia. *Capsule* inflated-globular, c. 7 mm. diam., pubescent, 2-valved, each valve very rarely 2-fid (but see below!). *Seeds*, flat, orbicular, c. 3.5 mm. diam. incl. the broad wing (c. 1 mm. wide), the body wrinkled and distinctly comma-like.

*Range*: South Western Province of Western Australia and South Australia.

*Habitat*: Waste places, cultivated land, open country in general.

*Chromosome number*:  $2n = 16$ .

*Typification*: *V. cynopotamica* F. Muell.—*Holotype*—Ad flumen cygnorum. Drummond no. 410 (MEL 9798)—*Isotypes*—(P.G.).

*Discussion*: Differs from *V. rosea*, q.v., in the smaller corolla size and from *V. hispida*, q.v., most conspicuously in the pink to white rather than yellow petals.

*Selected specimens examined*: *South Australia*: Wudinna, C. W. Johns, no. 14, 1941 (AD 96511201). *Western Australia*: 8–10 miles east of Calingirrie.



T. E. H. Aplin, no. 151, 10.9.1958 (PERTH): Eastern sources of the Swan River, Alice Eaton, 1891 (MEL 9975): Drummond no. 402 (K): Wongan Hills, A. Morrison, no. 120, 13128 11.Oct.1903 (PERTH.K): S. of Ogilvie, N. T. Burbidge no. 2170, 3.9.1947 (CANB 14541): Corrigin, R. Carolin, no. 3142, 17.8.1961 (SYD): Minginew, R. Carolin, no. 3404, 1.9.1961 (SYD): 8 miles east of Mukinbadin on Bencubbin Rd. W. J. Peacock, no. 60812.1, 7.8.1960 (SYD\*): 1 mile east of Goomalling, W. J. Peacock no. 60817.1. 6.8.1960 (SYD\*): Northam-Perth, H. Salasoo no. 18, 11.9.1949 (NSW 75652).

10. *V. hispida* W. V. Fitzg.

In *Journ. W.A. Nat. Hist. Soc.*, 1: 25 (1904).

Annual herb with a narrow tap-root and almost no caulorrhiza. *Leaves* all basal, narrow-obovate to narrow-elliptic in outline tapering into a distinct linear petiole, 5–8 cm. long (incl. petiole), 10–18 mm. wide, lyrate-pinnate or deeply pinnately dissected to dentate, obtuse, pubescent, with some villous wool at the  $\pm$  dilated base. *Peduncles* ascending up to 16 cm., pubescent, terete. *Bracteoles* often incised towards the slightly connate bases: lower ones narrow-ovate to ovate up to 2 cm. long and 5 mm. wide, pubescent to glabrescent, acute with very few short villous hairs in the axils: upper ones shorter and narrower. Central flowers on pedicels 1–3 cm. long. *Sepals* 5, scarcely connate at all, pubescent-villous on both surfaces, ciliate but entire, acute: posterior one ovate, 5 mm. long, 3 mm. wide; others slightly narrower but scarcely shorter. *Corolla* yellow, c. 8 mm. long with a short obscure anterior pocket, villous-pubescent outside, adnate to ovary to about 2/3rd. mark, almost quite glabrous inside with no enations: tube about 1 mm. long or less: superior lobes narrow-oblong-elliptic, 4 mm. long, 0.5 mm. wide  $\pm$  conspicuously winged (c. 0.5 mm. wide) with distinct  $\pm$  barbulate auricles, the wings widened above the auricles: inferior ones oblong to linear, 4–5 mm. long, 0.5 mm. wide, broadly (0.5 mm.) winged; connate part of inferior petals 3–4 mm. long. *Stamens* 5, free; filaments filiform, 1.5–2 mm. long: anthers sub-globular to short-oblong 0.5 mm. or less long. *Ovary* globular pubescent with a short dissepiment not reaching the mid-mark and bearing 6–8 ovules; style glabrous 1.5–2 mm. long; indusium broad-ovate, 0.5 mm. long, almost 1 mm. wide,  $\pm$  folded, scarcely geniculate with a few hairs scattered on the back and a slightly curved orifice beset with short white bristles (c. 0.5 mm.) even shorter on the lower lip. *Capsule* slightly pubescent, globular, c. 5 mm. diam., scarcely compressed,  $\pm$  equally 4-valved. *Seeds* brown, orbicular, c. 2.5 mm. diam. including the broad wing (c. 0.5 mm.), the body punctulate, comma-shaped.

*Range*: Salt Lake country of Western Australia.

*Habitat*: Unknown.

*Chromosome number*: Unknown.

*Typification*: *V. hispida* W. V. Fitzg.—*Holotype*—Nannine, W. V. Fitzgerald, Sept. 1903 (NSW 75661).

*Discussion*: This species differs from *V. cynopotamica*, with which it has been consistently confused, in the punctulate seeds, 4-valved, scarcely compressed capsules, and yellow corolla with broader wings, adnate almost to the ovary summit. There is no separate appendage above the auricle, although the widening of the wing at this point is probably homologous with it, as in *V. paradoxa*.

*Selected specimens examined*: *Western Australia*: Meekatharra, 25 miles toward Wiluna, W. J. Peacock, no. 60866.3, 18.8.1960 (SYD): Near Old Minnie creek H.S., E. of Laverton, A. S. George, no. 4656, July 13.1963 (PERTH): Glenorie Station, Malcolm N. T. Burbidge, no. 272, Aug. 1938 (PERTH.K): 13 miles South of Leonora on road to Menzies, T. E. H. Aplin, no. 2285,

T. E. H. Aplin, no. 151, 10.9.1958 (PERTH): Eastern sources of the Swan River, Alice Eaton, 1891 (MEL 9975): Drummond no. 402 (K): Wongan Hills, A. Morrison, no. 120, 13128 11.Oct.1903 (PERTH.K): S. of Ogilvie, N. T. Burbidge no. 2170, 3.9.1947 (CANB 14541): Corrigin, R. Carolin, no. 3142, 17.8.1961 (SYD): Minginew, R. Carolin, no. 3404, 1.9.1961 (SYD): 8 miles east of Mukinbadin on Bencubbin Rd. W. J. Peacock, no. 60812.1, 7.8.1960 (SYD\*): 1 mile east of Goomalling, W. J. Peacock no. 60817.1. 6.8.1960 (SYD\*): Northam-Perth, H. Salasoo no. 18, 11.9.1949 (NSW 75652).

10. *V. hispida* W. V. Fitzg.

In *Journ. W.A. Nat. Hist. Soc.*, 1: 25 (1904).

Annual herb with a narrow tap-root and almost no caulorrhiza. *Leaves* all basal, narrow-obovate to narrow-elliptic in outline tapering into a distinct linear petiole, 5–8 cm. long (incl. petiole), 10–18 mm. wide, lyrate-pinnate or deeply pinnately dissected to dentate, obtuse, pubescent, with some villous wool at the  $\pm$  dilated base. *Peduncles* ascending up to 16 cm., pubescent, terete. *Bracteoles* often incised towards the slightly connate bases: lower ones narrow-ovate to ovate up to 2 cm. long and 5 mm. wide, pubescent to glabrescent, acute with very few short villous hairs in the axils: upper ones shorter and narrower. Central flowers on pedicels 1–3 cm. long. *Sepals* 5, scarcely connate at all, pubescent-villous on both surfaces, ciliate but entire, acute: posterior one ovate, 5 mm. long, 3 mm. wide; others slightly narrower but scarcely shorter. *Corolla* yellow, c. 8 mm. long with a short obscure anterior pocket, villous-pubescent outside, adnate to ovary to about 2/3rd. mark, almost quite glabrous inside with no enations: tube about 1 mm. long or less: superior lobes narrow-oblong-elliptic, 4 mm. long, 0.5 mm. wide  $\pm$  conspicuously winged (c. 0.5 mm. wide) with distinct  $\pm$  barbulate auricles, the wings widened above the auricles: inferior ones oblong to linear, 4–5 mm. long, 0.5 mm. wide, broadly (0.5 mm.) winged; connate part of inferior petals 3–4 mm. long. *Stamens* 5, free; filaments filiform, 1.5–2 mm. long: anthers sub-globular to short-oblong 0.5 mm. or less long. *Ovary* globular pubescent with a short dissepiment not reaching the mid-mark and bearing 6–8 ovules; style glabrous 1.5–2 mm. long; indusium broad-ovate, 0.5 mm. long, almost 1 mm. wide,  $\pm$  folded, scarcely geniculate with a few hairs scattered on the back and a slightly curved orifice beset with short white bristles (c. 0.5 mm.) even shorter on the lower lip. *Capsule* slightly pubescent, globular, c. 5 mm. diam., scarcely compressed,  $\pm$  equally 4-valved. *Seeds* brown, orbicular, c. 2.5 mm. diam. including the broad wing (c. 0.5 mm.), the body punctulate, comma-shaped.

*Range*: Salt Lake country of Western Australia.

*Habitat*: Unknown.

*Chromosome number*: Unknown.

*Typification*: *V. hispida* W. V. Fitzg.—*Holotype*—Nannine, W. V. Fitzgerald, Sept. 1903 (NSW 75661).

*Discussion*: This species differs from *V. cynopotamica*, with which it has been consistently confused, in the punctulate seeds, 4-valved, scarcely compressed capsules, and yellow corolla with broader wings, adnate almost to the ovary summit. There is no separate appendage above the auricle, although the widening of the wing at this point is probably homologous with it, as in *V. paradoxa*.

*Selected specimens examined*: *Western Australia*: Meekatharra, 25 miles toward Wiluna, W. J. Peacock, no. 60866.3, 18.8.1960 (SYD): Near Old Minnie creek H.S., E. of Laverton, A. S. George, no. 4656, July 13.1963 (PERTH): Glenorie Station, Malcolm N. T. Burbidge, no. 272, Aug. 1938 (PERTH.K): 13 miles South of Leonora on road to Menzies, T. E. H. Aplin, no. 2285,



17.8.1963 (PERTH): Tuckanarra, C. A. Gardner, no. 2278, 14 July 1931 (PERTH): Mt. Harris, 32 miles north of Agnew on road to Wiluna, T. E. H. Aplin, no. 2378, 19.8.1963 (PERTH): 24 miles N. of Standstone, A. S. George, no. 2656, 29th July, 1963 (PERTH).

11. *V. ARGUTA* R.Br.

*Prodr.*, 580 (1810).

*Taxonomic synonym*: *Antherostylis calcarata* Gardner in *Journ. Roy. Soc. W. Austr.*, 19: 92 (1934).

Perennial herb with a stout tap-root and a thick (c. 5 mm.) strong, often branched, woody caulorrhiza covered with dead leaf bases. *Leaves* ascending from the caulorrhiza narrow-obovate to oblong-elliptic, tapering gradually towards the base into narrow petiole, 4–12 cm. long, up to 1 cm. wide, dentate (or rarely incised) with minutely acuminate teeth and usually terminated by an acute tooth, glabrous or almost so except for some short hairs in the axils. *Peduncles* ascending, terete, up to 40 cm. long, glabrous. *Bracteoles* free: lower one ovate to narrow-ovate, often deeply incised, up to 20 cm. long and 8 mm. wide, usually glabrous on the surface but with  $\pm$  ciliate margin and with some villous hairs in the axils, acute, almost quite free; upper ones linear and shorter. Central flowers on pedicels 4–9 (rarely up to 20) cm. long. *Sepals* 5, free, scarcely cordate, glabrous or  $\pm$  pubescent on outer surface especially towards the margin, covered with long villous hairs or almost glabrous on inner surface: posterior one oblong to narrow-ovate, 10–12 mm. long, 3–3.5 mm. wide; others narrower, c. 8 mm. long. *Corolla* yellow, frequently brownish towards the centre of each lobe, 12–20 mm. long with a prominent  $\pm$  curved spur 3–6 mm. long, pubescent on outer surface, glabrous inside with a few obscure wrinkles towards the base: tube 5–6 mm. long: superior ones narrow-elliptic-oblong, falcate, 8–15 mm. long, 2 mm. wide narrowly (1–2 mm.) winged with a narrow  $\pm$  barbulate auricle; the wing widening distinctly immediately above the auricle: inferior ones narrow-oblong, 8–15 mm. long, 2–3 mm. wide narrowly winged: connate part of inferior lobes 2–3.5 mm. long. *Stamens* 5: filaments linear, 4–5 mm. long and almost 1 mm. wide at the base: anthers narrow-oblong, c. 2.5 mm. long. *Ovary* ovoid, pubescent, dissepiment not reaching the mid-mark and bearing 10–16 ovules: style pubescent c. 3 mm. long: indusium folded, pubescent, oblong, 5–6 mm. long, 2–3.5 mm. wide with a very curved orifice beset with short white cilia or the upper lip glabrous: stigma scarcely lobed. *Capsule* ovoid, c. 9 mm. long, 6–8 mm. wide, densely pubescent but for a minute glabrous mucro, 4-valved but slightly unequally so. *Seeds* broad-elliptic, c. 4 mm. diameter including broad (2 mm.) wing; body almost smooth, long-acuminate towards the base.

*Range*: Drier parts of southern Australia from the Riverina in N.S.W. to S.W. Australia.

*Habitat*: Particularly on rocky outcrops in the drier areas.

*Chromosome number*: Unknown.

*Typification*: *V. arguta* R.Br.—*Holotype*—Base of the Mountains near Inlet no. XII South Coast. R. Brown (Bennett's no. 2548) BM. *Antherostylis calcarata* Gardner—*Holotype*—Jununa Rocks, C. A. Gardner, no. 2909, 24. Oct. 1931 (PERTH) *Isotype* (K).

*Discussion*: This has been confused with *V. paradoxa* in the past. It differs from that species in the higher indusium length-breadth ratio, i.e., 1.7–2.1, the  $\pm$  equal brownish corolla lobes and the less hairy leaves; the eastern specimens differ from the western ones in having a glabrous upper lip to the indusium with the Eucla specimens being intermediate in this respect.

17.8.1963 (PERTH): Tuckanarra, C. A. Gardner, no. 2278, 14 July 1931 (PERTH): Mt. Harris, 32 miles north of Agnew on road to Wiluna, T. E. H. Aplin, no. 2378, 19.8.1963 (PERTH): 24 miles N. of Standstone, A. S. George, no. 2656, 29th July, 1963 (PERTH).

11. *V. ARGUTA* R.Br.

*Prodr.*, 580 (1810).

*Taxonomic synonym*: *Antherostylis calcarata* Gardner in *Journ. Roy. Soc. W. Austr.*, 19: 92 (1934).

Perennial herb with a stout tap-root and a thick (c. 5 mm.) strong, often branched, woody caulorrhiza covered with dead leaf bases. *Leaves* ascending from the caulorrhiza narrow-obovate to oblong-elliptic, tapering gradually towards the base into narrow petiole, 4–12 cm. long, up to 1 cm. wide, dentate (or rarely incised) with minutely acuminate teeth and usually terminated by an acute tooth, glabrous or almost so except for some short hairs in the axils. *Peduncles* ascending, terete, up to 40 cm. long, glabrous. *Bracteoles* free: lower one ovate to narrow-ovate, often deeply incised, up to 20 cm. long and 8 mm. wide, usually glabrous on the surface but with  $\pm$  ciliate margin and with some villous hairs in the axils, acute, almost quite free; upper ones linear and shorter. Central flowers on pedicels 4–9 (rarely up to 20) cm. long. *Sepals* 5, free, scarcely cordate, glabrous or  $\pm$  pubescent on outer surface especially towards the margin, covered with long villous hairs or almost glabrous on inner surface: posterior one oblong to narrow-ovate, 10–12 mm. long, 3–3.5 mm. wide: others narrower, c. 8 mm. long. *Corolla* yellow, frequently brownish towards the centre of each lobe, 12–20 mm. long with a prominent  $\pm$  curved spur 3–6 mm. long, pubescent on outer surface, glabrous inside with a few obscure wrinkles towards the base: tube 5–6 mm. long: superior ones narrow-elliptic-oblong, falcate, 8–15 mm. long, 2 mm. wide narrowly (1–2 mm.) winged with a narrow  $\pm$  barbulate auricle; the wing widening distinctly immediately above the auricle: inferior ones narrow-oblong, 8–15 mm. long, 2–3 mm. wide narrowly winged: connate part of inferior lobes 2–3.5 mm. long. *Stamens* 5: filaments linear, 4–5 mm. long and almost 1 mm. wide at the base: anthers narrow-oblong, c. 2.5 mm. long. *Ovary* ovoid, pubescent, dissepiment not reaching the mid-mark and bearing 10–16 ovules: style pubescent c. 3 mm. long: indusium folded, pubescent, oblong, 5–6 mm. long, 2–3.5 mm. wide with a very curved orifice beset with short white cilia or the upper lip glabrous: stigma scarcely lobed. *Capsule* ovoid, c. 9 mm. long, 6–8 mm. wide, densely pubescent but for a minute glabrous mucro, 4-valved but slightly unequally so. *Seeds* broad-elliptic, c. 4 mm. diameter including broad (2 mm.) wing; body almost smooth, long-acuminate towards the base.

*Range*: Drier parts of southern Australia from the Riverina in N.S.W. to S.W. Australia.

*Habitat*: Particularly on rocky outcrops in the drier areas.

*Chromosome number*: Unknown.

*Typification*: *V. arguta* R.Br.—*Holotype*—Base of the Mountains near Inlet no. XII South Coast. R. Brown (Bennett's no. 2548) BM. *Antherostylis calcarata* Gardner—*Holotype*—Jununa Rocks, C. A. Gardner, no. 2909, 24. Oct. 1931 (PERTH) *Isotype* (K).

*Discussion*: This has been confused with *V. paradoxa* in the past. It differs from that species in the higher indusium length-breadth ratio, i.e., 1.7–2.1, the  $\pm$  equal brownish corolla lobes and the less hairy leaves; the eastern specimens differ from the western ones in having a glabrous upper lip to the indusium with the Eucla specimens being intermediate in this respect.



*Selected specimens examined:* New South Wales: Murrumbidgee River, G. Day, 1878 (MEL 9988): Barrier Range, Corona Station, Marjorie Collins, 9.1921 (SYD): Near Silverton, Mrs. Irvine, 8.1889 (MEL 10013): Broken Hill, E. C. Andrews, 12.1917 (NSW 78428): Victoria: Dimboola, H. E. D'Alton, 1901 (NSW 78425): South Australia: Nat. Park, Belair, O. E. Menzel, Oct. 1896 (AD 96511014 *pro parte*): Lower Murray Scrub, Rev. W. Schwarz, 1890 (MEL 9955): Flinders Range, M. Koch, no. 583, 10.1901 (NSW 78424): Wirrulla, ex. Herb. J. M. Black (AD 96511130): Ooldea, Mrs. Bates, 2.5.1921 ex Herb. J. M. Black (AD 96511026): Western Australia: Eucla to Madura, R. Carolin, 27.8.1963 (SYD): About 1 mile west of Cocklebiddy, A. R. Main, 29.Aug.1955 (PERTH): Near Mt. Rugged, Miss Brookes, 1889 (MEL 10001).

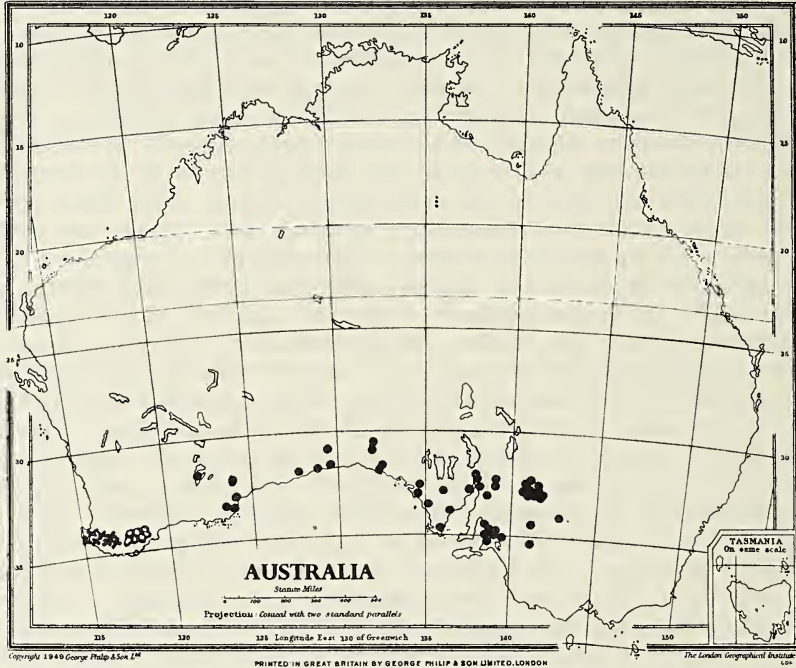


Fig. 8. Distribution of *V. arguta* (●), *V. macrophylla* (X) and *V. foliosa* (O).

## 12. *V. PARADOXA* R. Br.

*Prodr.*, 580 (1810): *Bot Reg.*, t 971 (1826): DC. *Prodr.*, 7:518 (1839): De Vriese, *Gooden.*, 172 (1854): Hook. f., *Fl. Tasm.*, 1:233 (1855): Benth., *Fl. Austr.*, 4:48 (1869): Moore et Betche, *Hdbk. Fl. N.S.W.*, 309 (1893): Bailey, *Qld. Fl.*, 3:893 (1900): Rodway, *Tasm. Fl.*, 101 (1903): Krause in *Pflrch.*, 54:35 (1912): Ewart, *Fl. Vict.*, 1067 (1931): Robertson in *Black. Fl. S. Austr.*, ed. 2, 4:827 (1957): Curtis, *Stud. Fl. Tasm.*, 2:398 (1963).

*Taxonomic synonym:* *V. paradoxa* var. *stenoptera* F. Muell. ex Benth., *Fl. Austr.*, 4:48 (1869): Krause in *Pflrch.*, 54:37 (1912).

Perennial herb with a stout tap root and very short, frequently branched stems usually covered with dead leaf bases. *Leaves* erect or ascending, narrow-obovate to oblong or elliptic and gradually narrowing into a long-linear petiole 1–15 cm. long, 7–25 cm. long incl. petiole, 15–30 mm. wide, dentate to almost entire, obtuse ± glabrescent on both surfaces except for midribs, ciliate at the margins, with scarcely any wool in the axils. *Peduncles* erect or ascending or rarely decumbent, terete, 10–40 cm. tall, pubescent with simple mostly patent hairs. *Bracteoles* free: lower ones oblong to ovate, frequently deeply dentate even to appear 2-fid, up to 3 cm. long and 6 mm. wide, but usually

*Selected specimens examined:* New South Wales: Murrumbidgee River, G. Day, 1878 (MEL 9988): Barrier Range, Corona Station, Marjorie Collins, 9.1921 (SYD): Near Silverton, Mrs. Irvine, 8.1889 (MEL 10013): Broken Hill, E. C. Andrews, 12.1917 (NSW 78428): Victoria: Dimboola, H. E. D'Alton, 1901 (NSW 78425): South Australia: Nat. Park, Belair, O. E. Menzel, Oct. 1896 (AD 96511014 *pro parte*): Lower Murray Scrub, Rev. W. Schwarz, 1890 (MEL 9955): Flinders Range, M. Koch, no. 583, 10.1901 (NSW 78424): Wirrulla, ex. Herb. J. M. Black (AD 96511130): Ooldea, Mrs. Bates, 2.5.1921 ex Herb. J. M. Black (AD 96511026): Western Australia: Eucla to Madura, R. Carolin, 27.8.1963 (SYD): About 1 mile west of Cocklebidy, A. R. Main, 29.Aug.1955 (PERTH): Near Mt. Rugged, Miss Brookes, 1889 (MEL 10001).

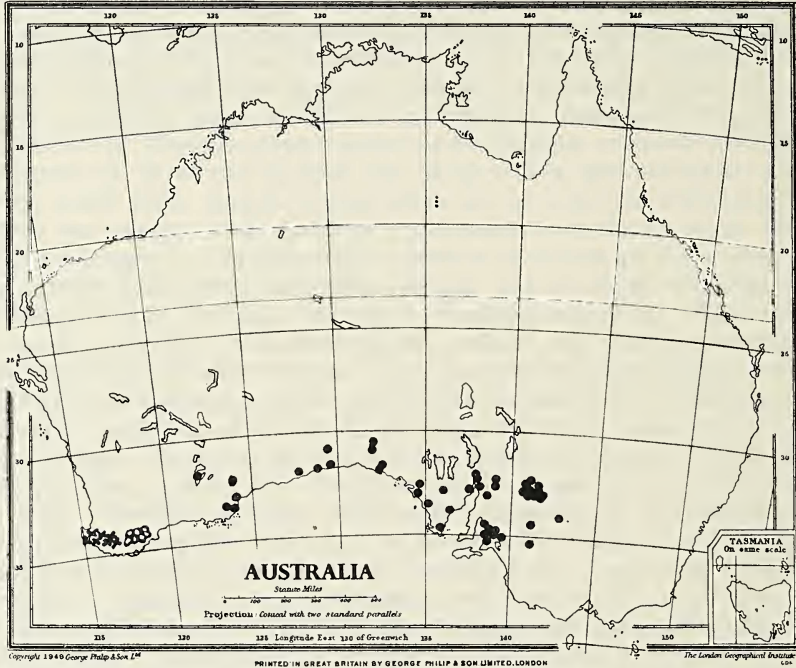


Fig. 8. Distribution of *V. arguta* (●), *V. macrophylla* (X) and *V. foliosa* (O).

## 12. *V. PARADOXA* R. Br.

*Prodr.*, 580 (1810): *Bot Reg.*, t 971 (1826): DC. *Prodr.*, 7:518 (1839): De Vriese, *Gooden.*, 172 (1854): Hook. f., *Fl. Tasm.*, 1:233 (1855): Benth., *Fl. Austr.*, 4:48 (1869): Moore et Betche, *Hdbk. Fl. N.S.W.*, 309 (1893): Bailey, *Qld. Fl.*, 3:893 (1900): Rodway, *Tasm. Fl.*, 101 (1903): Krause in *Pflrch.*, 54:35 (1912): Ewart, *Fl. Vict.*, 1067 (1931): Robertson in *Black. Fl. S. Austr.*, ed. 2, 4:827 (1957): Curtis, *Stud. Fl. Tasm.*, 2:398 (1963).

*Taxonomic synonym:* *V. paradoxa* var. *stenoptera* F. Muell. ex Benth., *Fl. Austr.*, 4:48 (1869): Krause in *Pflrch.*, 54:37 (1912).

Perennial herb with a stout tap root and very short, frequently branched stems usually covered with dead leaf bases. *Leaves* erect or ascending, narrow-obovate to oblong or elliptic and gradually narrowing into a long-linear petiole 1–15 cm. long, 7–25 cm. long incl. petiole, 15–30 mm. wide, dentate to almost entire, obtuse ± glabrescent on both surfaces except for midribs, ciliate at the margins, with scarcely any wool in the axils. *Peduncles* erect or ascending or rarely decumbent, terete, 10–40 cm. tall, pubescent with simple mostly patent hairs. *Bracteoles* free: lower ones oblong to ovate, frequently deeply dentate even to appear 2-fid, up to 3 cm. long and 6 mm. wide, but usually



shorter,  $\pm$  pubescent especially so on the under-surface and on the midrib, ciliate, obtuse, with short axillary hairs. Central flowers on pedicels up to 10 cm. long. *Sepals* 5, free, pubescent on both surfaces but more so on inner surface, ciliate, entire: posterior sepal ovate to oblong, 4–9 mm. long, 1.5–3.5 mm. wide, acute: lateral ones narrower and slightly shorter. *Corolla* yellow, 10–20 mm. long with an anterior spur up to 7.5 mm. long or reduced to an obscure pocket, pubescent outside, glabrous or nearly so inside with no enations, adnate to the ovary up to 1/3rd of the length of ovary: tube 3–5 mm. long: superior lobes narrow-oblong, falcate, 5–13 mm. long, up to 2 mm. wide with obscurely dentate lateral wings up to 3 mm. wide and well developed slightly barbulate auricles up to 3.5 mm. wide; the wings distinctly broader just above the auricles: inferior lobes up to 10 cm. long and 3 mm. wide with broad lateral wings; connate part of inferior lobes to 4–5 mm. long. *Stamens* 5: filaments linear 3–5 mm. long: anthers narrow-oblong, 2.5–3 mm. long: connective obtuse. *Ovary* ovoid, pubescent with a dissepiment reaching to about  $\frac{1}{4}$ -mark and bearing 8–14 ovules; style glabrous or with a few scattered hairs, 3–6 mm. long: indusium pubescent, folded, ovate when flattened out, 3–6 mm. long, 2–4 mm. wide with a curved orifice beset with minute cilia: stigma scarcely lobed. *Capsule* ovoid, sometimes  $\pm$  compressed, up to 9 mm. long, and 5 mm. diam., densely pubescent but for a minute glabrous mucro, 4-valved although sometimes unequally so. *Seeds* flat, orbicular, 3–5 mm. diam., incl. wing, brown, the wing from almost obsolete to 1 mm. diam.

*Range*: Southern Australia, from Eyre Peninsula eastwards and northwards into southern Queensland and southwards into Tasmania.

*Habitat*: Grasslands and woodlands.

*Chromosome number*:  $n = 8$ .

*Typification*: *V. paradoxa* R.Br.—*Lectotype*—Cow Pasture Plains, 1803 Oct., R. Brown (BM): *Isotypes*—(K. NSW 78419.BRI 058738). Brown gives specimens from three localities with his original description but two of these specimens have entire leaves. The one with dentate leaves is selected here since the description states “foliis obtus dentatis”. *V. paradoxa* var. *stenoptera* F. Muell. ex Benth. syntypes—Bentham cites no actual specimens but says “to this belong the Queensland and the New England and Richmond River specimens”. Several specimens agreeing with his description come from this region.

*Discussion*: A very widespread species which shows some considerable variation but it is rather difficult to define this variation in terms of the taxonomic hierarchy at present. In addition to what appears to be a gradual decrease in the size of seed-wing towards the north, there are some fleshy-leaved maritime forms in southern Queensland and northern New South Wales.

*Selected specimens examined*: *Queensland*: North Baffle Creek, Port Curtis Distr., Miss W. M. Peterson, 10.1930 (BRI 058733): Timba, plains of the Condamine, Leichhardt (MEL 9859): Darling Downs between Cambooya and Clifton, C. T. White, no. 12663, 19.10.1944 (BRI 1058730): Texas, J. L. Boorman, 9.1910 (NSW 78414): *New South Wales*: New England, Rev. R. Collie, 1886 (MEL 9980): Armidale, Mrs. Consett Davis, no. 142, 9.Jan.1941 (NSW 78447): North of Ulan, W. J. Peacock, no. 6111.8.1, Nov. 1961 (SYD\*): Salisbury Plains, New England, R. W. Jessup and M. Gray, no. 3033, 12.1954 (CANB 94138, NSW 78452): Warrumbungle Ranges, W. Forsyth, 10.1901 (NSW 78463): 70 miles west of Cobar, P. Brough and N. C. Beadle, 24.8.1939 (SYD): 12 miles south of Dubbo, W. J. Peacock no. 6110.11.2, Oct. 1921 (SYD\*): Sydney, Mosman, no. 167 (BRI 058779): Jenolan Caves, W. F. Blakely, 12.1899 (NSW 78444): Wagga, J. J. Fletcher, 5.1.1891 (NSW 78459): Braidwood District, W. Bäuerlen, no. 382, Jan. 1885 (MEL 9949): Kosciusko below Sawpit Creek, J. McLuckie and A. H. K. Petrie, Jan. 1925 (SYD. CANB



shorter,  $\pm$  pubescent especially so on the under-surface and on the midrib, ciliate, obtuse, with short axillary hairs. Central flowers on pedicels up to 10 cm. long. *Sepals* 5, free, pubescent on both surfaces but more so on inner surface, ciliate, entire: posterior sepal ovate to oblong, 4–9 mm. long, 1.5–3.5 mm. wide, acute: lateral ones narrower and slightly shorter. *Corolla* yellow, 10–20 mm. long with an anterior spur up to 7.5 mm. long or reduced to an obscure pocket, pubescent outside, glabrous or nearly so inside with no enations, adnate to the ovary up to 1/3rd of the length of ovary: tube 3–5 mm. long: superior lobes narrow-oblong, falcate, 5–13 mm. long, up to 2 mm. wide with obscurely dentate lateral wings up to 3 mm. wide and well developed slightly barbulate auricles up to 3.5 mm. wide; the wings distinctly broader just above the auricles: inferior lobes up to 10 cm. long and 3 mm. wide with broad lateral wings; connate part of inferior lobes to 4–5 mm. long. *Stamens* 5: filaments linear 3–5 mm. long: anthers narrow-oblong, 2.5–3 mm. long: connective obtuse. *Ovary* ovoid, pubescent with a dissepiment reaching to about  $\frac{1}{4}$ -mark and bearing 8–14 ovules; style glabrous or with a few scattered hairs, 3–6 mm. long: indusium pubescent, folded, ovate when flattened out, 3–6 mm. long, 2–4 mm. wide with a curved orifice beset with minute cilia: stigma scarcely lobed. *Capsule* ovoid, sometimes  $\pm$  compressed, up to 9 mm. long, and 5 mm. diam., densely pubescent but for a minute glabrous mucro, 4-valved although sometimes unequally so. *Seeds* flat, orbicular, 3–5 mm. diam., incl. wing, brown, the wing from almost obsolete to 1 mm. diam.

*Range*: Southern Australia, from Eyre Peninsula eastwards and northwards into southern Queensland and southwards into Tasmania.

*Habitat*: Grasslands and woodlands.

*Chromosome number*:  $n = 8$ .

*Typification*: *V. paradoxa* R.Br.—*Lectotype*—Cow Pasture Plains, 1803 Oct., R. Brown (BM): *Isotypes*—(K. NSW 78419.BRI 058738). Brown gives specimens from three localities with his original description but two of these specimens have entire leaves. The one with dentate leaves is selected here since the description states “foliis obtus dentatis”. *V. paradoxa* var. *stenoptera* F. Muell. ex Benth. syntypes—Bentham cites no actual specimens but says “to this belong the Queensland and the New England and Richmond River specimens”. Several specimens agreeing with his description come from this region.

*Discussion*: A very widespread species which shows some considerable variation but it is rather difficult to define this variation in terms of the taxonomic hierarchy at present. In addition to what appears to be a gradual decrease in the size of seed-wing towards the north, there are some fleshy-leaved maritime forms in southern Queensland and northern New South Wales.

*Selected specimens examined*: *Queensland*: North Baffle Creek, Port Curtis Distr., Miss W. M. Peterson, 10.1930 (BRI 058733): Timba, plains of the Condamine, Leichhardt (MEL 9859): Darling Downs between Cambooya and Clifton, C. T. White, no. 12663, 19.10.1944 (BRI 1058730): Texas, J. L. Boorman, 9.1910 (NSW 78414): *New South Wales*: New England, Rev. R. Collie, 1886 (MEL 9980): Armidale, Mrs. Consett Davis, no. 142, 9.Jan.1941 (NSW 78447): North of Ulan, W. J. Peacock, no. 6111.8.1, Nov. 1961 (SYD\*): Salisbury Plains, New England, R. W. Jessup and M. Gray, no. 3033, 12.1954 (CANB 94138, NSW 78452): Warrumbungle Ranges, W. Forsyth, 10.1901 (NSW 78463): 70 miles west of Cobar, P. Brough and N. C. Beadle, 24.8.1939 (SYD): 12 miles south of Dubbo, W. J. Peacock no. 6110.11.2, Oct. 1921 (SYD\*): Sydney, Mosman, no. 167 (BRI 058779): Jenolan Caves, W. F. Blakely, 12.1899 (NSW 78444): Wagga, J. J. Fletcher, 5.1.1891 (NSW 78459): Braidwood District, W. Bäuerlen, no. 382, Jan. 1885 (MEL 9949): Kosciusko below Sawpit Creek, J. McLuckie and A. H. K. Petrie, Jan. 1925 (SYD. CANB



8192). Delegate, Howitt, no. 574, 1883 (MEL 9933). *Australian Capital Territory*: Gudgenby, R. H. Cambage, no. 3392, 14.1.1912 (NSW 78440): 1 mile north of Dingo Dell Flats, P. Darbyshire, no. 46, 7. Dec. 1960 (CANB 86032. NSW 78434.K): *Victoria*: Mansfield, R. A. Black, no. 587.000 (2), 13.1.1940 (MEL 9901): Wimmera, Dallachy (MEL 9876.K): Omeo, C. Allen ex Herb. Morris, 1920 (ADW 15000): Laverton, Helen I. Aston, no. 835, 16.10.1962 (BRI 055998). *Tasmania*: New Town, D. Spicer, Jan. 23. 1876 (K): Launceston, F. A. Rodway, 12.1915 (NSW 78420): Gunn, no. 46 (K): *South Australia*: Naracoorte, E. H. Ising, 26.10.1933 (AD 96511008): Mt. Lofty Ranges, M. Koch, no. 583, 9.1902 (NSW 78404): Blackwood, J. M. Black, 20.10.1913 (AD 96511132).

### 13. V. GLABRATA, sp. nov.

Herba annua radice principali tenui et caule brevissimo. Folia lyrata vel dentata. Pedunculi erecti vel ascendentes usque ad 4–20 cm., admodum vel fere glabri. Bracteolae dentatae vel profunde incisae. Sepala 5, libera, postice glabra. Corolla flava 12–14 mm. longa  $\pm$  calcarata, lobi antici parte connato partem liberum aequanti vel paulo superanti. Indusium depresso ovatum. Ala seminis lata.

Annual herb with thin tap-root and very short, only slightly branched stem. *Leaves* ascending, lyrate-incised or deeply dentate becoming less so towards the apex, oblong or narrow-obovate in outline but narrowing  $\pm$  gradually into a linear petiole 1.5–4 cm. long; the whole leaf 4–8 cm. long, up to 1 cm. wide, usually obtuse, glabrous or sprinkled with a few short hairs and frequently ciliate with some short villous hairs in the axils. *Peduncles* erect or ascending, 4–20 cm. tall, quite glabrous or with a few long villous hairs, terete. *Bracteoles*: lower ones ovate to lanceolate, frequently dentate and even deeply incised to appear 2- or more -fid, 8–20 mm. long, up to 4 mm. wide, acute, glabrous or with a few scattered hairs, connate basally into a tube or funnel scarcely 2 mm. long: upper ones linear, smaller scarcely incised: central flowers on pedicels 8–20 mm. long. *Sepals* 5, scarcely connate; posterior one ovate to broad-elliptic, 5–6 mm. long, c. 3 mm. wide, acute, glabrous on the outer surface, and with a few antrorse hairs on the inner surface, entire or rarely dentate towards the base; lateral ones narrow-ovate c. 1 mm. wide, slightly shorter than posterior petal. *Corolla* yellow, 12–14 mm. long with an obscure anterior pocket or a spur up to 2.5 mm. long, adnate to the ovary to c. the mid-mark, pubescent on outer surface, villous towards the base on the inner surface, without enations: tube 2.5–3.5 mm. long: superior lobes oblong-narrow-obovate 6–8 mm. long, 2 mm. wide, broadly (2 mm. wide) winged with prominent slightly barbate auricles; the wings broadened just above the auricle: inferior lobes elliptic-oblong; connate part of inferior lobes 4–6.5 mm. long. *Stamens* 5: filaments linear, c. 2 mm. long; anthers narrow-oblong to linear, c. 1.5 mm. long, obtuse. *Ovary* ovoid, minutely pubescent, dissepiment very short bearing c. 6–12 ovules: style  $\pm$  pubescent, c. 4 mm. long: indusium folded, very depressed-ovate when flattened,  $\pm$  villous especially towards the base, c. 2 mm. long, 3 mm. wide with a slightly curved orifice beset with small cilia. *Capsule* sub-globular, sometimes  $\pm$  compressed, c. 5 mm. diam., shortly pubescent, surmounted by a minute mucro,  $\pm$  equally 4-valved. *Seeds* flat, orbicular, 4.5 mm. diam. including the broad (1 mm.) wing, brown, punctulate.

*Range*: The drier parts of southern Australia.

*Habitat*: Scrubs and open desert communities.

*Chromosome number*: Unknown.

*Typification*: Urumburi, South of Thargomindah, Queensland. R. C. Carolin, no. 4080, 16. Aug. 1964 (NSW 100797).

8192). Delegate, Howitt, no. 574, 1883 (MEL 9933). *Australian Capital Territory*: Gudgenby, R. H. Cambage, no. 3392, 14.1.1912 (NSW 78440): 1 mile north of Dingo Dell Flats, P. Darbyshire, no. 46, 7. Dec. 1960 (CANB 86032. NSW 78434.K): *Victoria*: Mansfield, R. A. Black, no. 587.000 (2), 13.1.1940 (MEL 9901): Wimmera, Dallachy (MEL 9876.K): Omeo, C. Allen ex Herb. Morris, 1920 (ADW 15000): Laverton, Helen I. Aston, no. 835, 16.10.1962 (BRI 055998). *Tasmania*: New Town, D. Spicer, Jan. 23. 1876 (K): Launceston, F. A. Rodway, 12.1915 (NSW 78420): Gunn, no. 46 (K): *South Australia*: Naracoorte, E. H. Ising, 26.10.1933 (AD 96511008): Mt. Lofty Ranges, M. Koch, no. 583, 9.1902 (NSW 78404): Blackwood, J. M. Black, 20.10.1913 (AD 96511132).

### 13. V. GLABRATA, sp. nov.

Herba annua radice principali tenui et caule brevissimo. Folia lyrata vel dentata. Pedunculi erecti vel ascendentes usque ad 4–20 cm., admodum vel fere glabri. Bracteolae dentatae vel profunde incisae. Sepala 5, libera, postice glabra. Corolla flava 12–14 mm. longa  $\pm$  calcarata, lobi antici parte connato partem liberum aequanti vel paulo superanti. Indusium depresso ovatum. Ala seminis lata.

Annual herb with thin tap-root and very short, only slightly branched stem. *Leaves* ascending, lyrate-incised or deeply dentate becoming less so towards the apex, oblong or narrow-obovate in outline but narrowing  $\pm$  gradually into a linear petiole 1.5–4 cm. long; the whole leaf 4–8 cm. long, up to 1 cm. wide, usually obtuse, glabrous or sprinkled with a few short hairs and frequently ciliate with some short villous hairs in the axils. *Peduncles* erect or ascending, 4–20 cm. tall, quite glabrous or with a few long villous hairs, terete. *Bracteoles*: lower ones ovate to lanceolate, frequently dentate and even deeply incised to appear 2- or more -fid, 8–20 mm. long, up to 4 mm. wide, acute, glabrous or with a few scattered hairs, connate basally into a tube or funnel scarcely 2 mm. long: upper ones linear, smaller scarcely incised: central flowers on pedicels 8–20 mm. long. *Sepals* 5, scarcely connate; posterior one ovate to broad-elliptic, 5–6 mm. long, c. 3 mm. wide, acute, glabrous on the outer surface, and with a few antrorse hairs on the inner surface, entire or rarely dentate towards the base; lateral ones narrow-ovate c. 1 mm. wide, slightly shorter than posterior petal. *Corolla* yellow, 12–14 mm. long with an obscure anterior pocket or a spur up to 2.5 mm. long, adnate to the ovary to c. the mid-mark, pubescent on outer surface, villous towards the base on the inner surface, without enations: tube 2.5–3.5 mm. long: superior lobes oblong-narrow-obovate 6–8 mm. long, 2 mm. wide, broadly (2 mm. wide) winged with prominent slightly barbate auricles; the wings broadened just above the auricle: inferior lobes elliptic-oblong; connate part of inferior lobes 4–6.5 mm. long. *Stamens* 5: filaments linear, c. 2 mm. long; anthers narrow-oblong to linear, c. 1.5 mm. long, obtuse. *Ovary* ovoid, minutely pubescent, dissepiment very short bearing c. 6–12 ovules: style  $\pm$  pubescent, c. 4 mm. long: indusium folded, very depressed-ovate when flattened,  $\pm$  villous especially towards the base, c. 2 mm. long, 3 mm. wide with a slightly curved orifice beset with small cilia. *Capsule* sub-globular, sometimes  $\pm$  compressed, c. 5 mm. diam., shortly pubescent, surmounted by a minute mucro,  $\pm$  equally 4-valved. *Seeds* flat, orbicular, 4.5 mm. diam. including the broad (1 mm.) wing, brown, punctulate.

*Range*: The drier parts of southern Australia.

*Habitat*: Scrubs and open desert communities.

*Chromosome number*: Unknown.

*Typification*: Urumburi, South of Thargomindah, Queensland. R. C. Carolin, no. 4080, 16. Aug. 1964 (NSW 100797).



*Discussion*: This species has previously been included with *V. paradoxa* R.Br. It differs from this latter species in the glabrous, or nearly so, peduncles; the lyrate-incised leaves; the shorter indusium with a ratio of length to breadth of c. 1; the longer connate region of the inferior corolla lobes and, consequently, shorter inferior corolla lobes themselves. In almost all the specimens from Western Australia the spur is reduced to an obscure pocket.

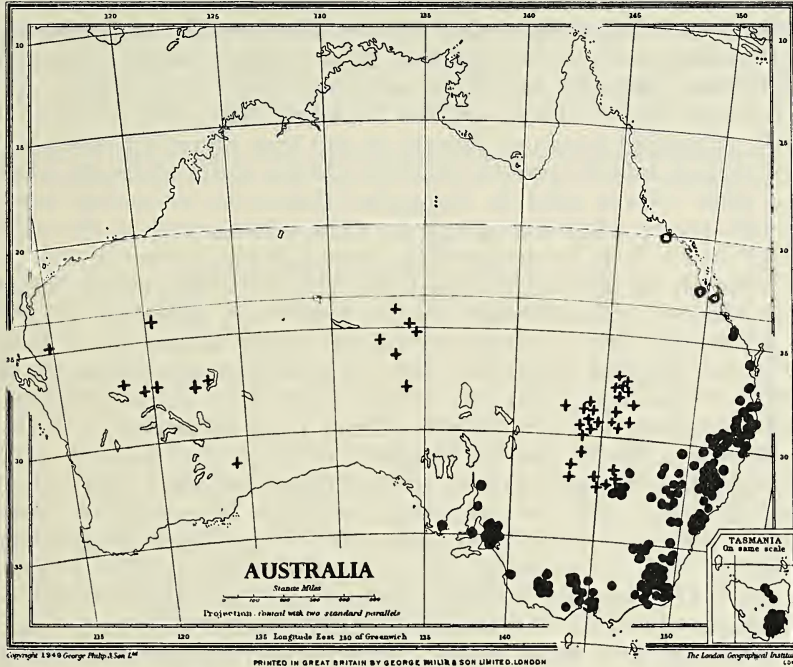


Fig. 9. Distribution of *V. glabrata* (●), *V. paradoxa* (+) and *V. pubescens* (○).

*Selected specimens examined*: *Queensland*: Charleville, E. W. Bick, Dec. 1916 (BRI 058737. NSW 78400): Gilruth Plains near Cunnamulla, S. L. Everist, no. 1641, 17.9.1938 (BRI 058822): Nockatunga, R. Carolin, no. 4162, 17.8.1964 (SYD): Thargomindah, R. Carolin, no. 4067, 16.8.1964 (SYD): Boorera Station north of Hungerford, R. Carolin, no. 4051, 15.8.1964 (SYD). *New South Wales*: Coolabah, J. H. Maiden and J. L. Boorman, 12.1908 (NSW 78480. SYD): White Cliffs, J. Farrell, 7.1914 (NSW 78482): Mt. Drysdale, N. C. Beadle, 2.1921 (SYD): *South Australia*: c. 30 miles N.W. Woomera, F. L. Hill, no. 18, 1.9.1953 (CANB 31667. BM): *Western Australia*: Sandstone Rd. 60 miles from Wiluna, F. M. Bennett, July 1941 (PERTH): 6 miles South of Meekatharra, C. A. Gardner, no. 2302, 15. July, 1931 (PERTH). *Northern Territory*: Charlote Waters, O. Schwartz, 1889 (MEL 9997): 3-6 miles west of Curtin Springs H. S., G. Chippendale, 12.9.1956 (NT 2860. NSW 78402. CANB 38636).

#### Section VELLEIA

Sepals 3, free or only shortly connate: seeds with thickened rim but scarcely winged.

*Synonyms*: *Velleia verae* R.Br. Prodr. 580(1810): De Vriese, Gooden. 173(1854). Sect. *Trisepala* Krause in Pflrch., 54:28(1912).

*Typification*: sect. *Velleia*—*Holotype*—*V. lyrata* R.Br. *Velleia verae*—*Lectotype*—*V. lyrata* R.Br. sect. *Trisepala* Krause—*Lectotype*—*V. lyrata* R.Br.

*Discussion*: This species has previously been included with *V. paradoxa* R.Br. It differs from this latter species in the glabrous, or nearly so, peduncles; the lyrate-incised leaves; the shorter indusium with a ratio of length to breadth of c. 1; the longer connate region of the inferior corolla lobes and, consequently, shorter inferior corolla lobes themselves. In almost all the specimens from Western Australia the spur is reduced to an obscure pocket.

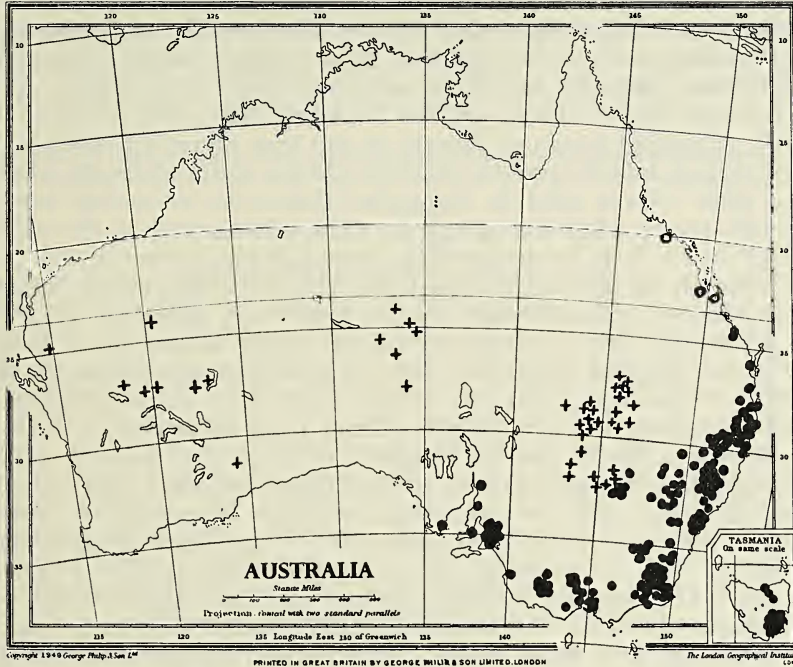


Fig. 9. Distribution of *V. glabrata* (●), *V. paradoxa* (+) and *V. pubescens* (○).

*Selected specimens examined*: Queensland: Charleville, E. W. Bick, Dec. 1916 (BRI 058737. NSW 78400): Gilruth Plains near Cunnamulla, S. L. Everist, no. 1641, 17.9.1938 (BRI 058822): Nockatunga, R. Carolin, no. 4162, 17.8.1964 (SYD): Thargomindah, R. Carolin, no. 4067, 16.8.1964 (SYD): Boorera Station north of Hungerford, R. Carolin, no. 4051, 15.8.1964 (SYD). New South Wales: Coolabah, J. H. Maiden and J. L. Boorman, 12.1908 (NSW 78480. SYD): White Cliffs, J. Farrell, 7.1914 (NSW 78482): Mt. Drysdale, N. C. Beadle, 2.1921 (SYD): South Australia: c. 30 miles N.W. Woomera, F. L. Hill, no. 18, 1.9.1953 (CANB 31667. BM): Western Australia: Sandstone Rd. 60 miles from Wiluna, F. M. Bennett, July 1941 (PERTH): 6 miles South of Meekatharra, C. A. Gardner, no. 2302, 15. July, 1931 (PERTH). Northern Territory: Charlote Waters, O. Schwartz, 1889 (MEL 9997): 3-6 miles west of Curtin Springs H. S., G. Chippendale, 12.9.1956 (NT 2860. NSW 78402. CANB 38636).

#### Section VELLEIA

Sepals 3, free or only shortly connate: seeds with thickened rim but scarcely winged.

*Synonyms*: *Velleiae verae* R.Br. Prodr. 580 (1810): De Vriese, Gooden. 173 (1854). Sect. *Trisepala* Krause in Pflrch., 54:28 (1912).

*Typification*: sect. *Velleia*—*Holotype*—*V. lyrata* R.Br. *Velleiae verae*—*Lectotype*—*V. lyrata* R.Br. sect. *Trisepala* Krause—*Lectotype*—*V. lyrata* R.Br.



14. *V. LYRATA* R.Br.

*Prodr.*, 580(1810): Hook., *Exot. Fl.*, t.24(1823): *Bot. Reg.*, t.551: DC. *Prodr.*, 7:518(1839): De Vriese, *Gooden.*, 173(1854): Benth., *Fl. Austr.*, 4:49(1869): Moore et Betche, *Hdbk. Fl. N.S.W.*, 310(1893): Krause in *Pflrch.*, 54:29(1912).

*Misapplied name*: *V. spathulata* sensu Juss. et Rich., in *Ann. Mus. Par.*, 18:17, t.4(1811) non R.Br.

Perennial herb with tap roots and a short, thick caulorrhiza covered with dead leaf-bases. *Leaves* ascending to prostrate, towards the summit of the caulorrhiza, obovate to narrow-obovate-elliptic, narrowing gradually towards the base into a linear petiole, 3–18 cm. long (incl. petiole) 1–4 cm. wide, thick, pinnatifid-lyrate or serrate at the base becoming dentate towards the apex and each lobe frequently dentate, obtuse, quite glabrous or nearly so except for some villous wool in the axils. *Peduncles* ascending to erect, up to 50 cm. tall, terete, glabrous except for some villous wool in the axils of the bracts. *Bracteoles* free, or connate at extreme base, ovate-elliptic to linear, entire or minutely dentate, glabrous; lower ones 4–15 cm. long, 1–4 mm. wide; upper ones smaller and narrower. Centre flowers on pedicels 5–15 mm. long. *Sepals* 3, completely free or nearly so, cordate, glabrous outside, villous inside or rarely quite glabrous, entire or with a few narrow teeth towards the base, acute; posterior one very distinctly cordate at the base, broad-ovate to narrow ovate, 4–8 mm. long, 2–8 mm. wide; lateral ones narrower. *Corolla* yellow with an obscure anterior pocket, sparsely to densely pubescent outside but for the wings, slightly pubescent or villous inside, adnate to the ovary to just above the midmark; tube 3–4 mm. long; superior lobes narrow-obovate, 4–8 mm. long, 1–2 mm. wide, broadly (1 mm. wide) winged with prominent auricles c. 1 mm. wide which are barbulate on the margin; inferior lobes 3–6 mm. long, 1–2 mm. wide, also broadly winged; connate part of inferior lobes 3–5 mm. long with small enations. *Stamens* 5: filaments narrow-linear, 2–3 mm. long; anthers linear, 1–2 mm. long, obtuse. *Ovary* ovoid to globular, pubescent in upper part with a dissepiment reaching the mid-mark bearing 4–10 ovules; style 2–4 mm. long with scattered villous hairs; indusium  $\pm$  erect, slightly folded with villous hairs on both surfaces, very-broad-ovate, 1–2 mm. wide with a slightly curved orifice beset with prominent white bristles. *Capsule* ovoid to sub-globular, 3–6 mm. diam., glabrous or pubescent,  $\pm$  equally 4-valved. *Seeds* flat orbicular to elliptic, 1–2.5 mm. wide, minutely punctulate, surrounded by a very narrow rim.

*Range*: Central coast of N.S.W.

*Habitat*: Swamps and other wet sites on sandstone.

*Chromosome number*:  $n = 8$ .

*Discussion*: Distinguished from *V. spathulata* by the glabrous peduncles and the cordate posterior sepal and from *V. parvisepata* by free, cordate sepals.

Hamilton (*Austr. Nat.*, 2:212(1913)) noted that specimens of "*V. spathulata*" from National Park were quite different from those occurring at Narrabeen. In fact the National Park specimens are a form of *V. lyrata* with shorter corolla, narrower posterior sepal and fewer (4) ovules per ovary. All these characters, however, appear to intergrade with those of the typical form and consequently it does not seem appropriate to raise this variation to taxonomic rank. A specimen from the Clarence River (NSW 75585) is placed in this species but the pedicels are definitely pubescent and in its narrower sepals and leafy basal bracts it shows some resemblance to *V. macrocalyx*.

14. *V. LYRATA* R.Br.

*Prodr.*, 580(1810): Hook., *Exot. Fl.*, t.24(1823): *Bot. Reg.*, t.551: DC. *Prodr.*, 7:518(1839): De Vriese, *Gooden.*, 173(1854): Benth., *Fl. Austr.*, 4:49(1869): Moore et Betche, *Hdbk. Fl. N.S.W.*, 310(1893): Krause in *Pflrch.*, 54:29(1912).

*Misapplied name*: *V. spathulata* sensu Juss. et Rich., in *Ann. Mus. Par.*, 18:17, t.4(1811) non R.Br.

Perennial herb with tap roots and a short, thick caulorrhiza covered with dead leaf-bases. *Leaves* ascending to prostrate, towards the summit of the caulorrhiza, obovate to narrow-obovate-elliptic, narrowing gradually towards the base into a linear petiole, 3–18 cm. long (incl. petiole) 1–4 cm. wide, thick, pinnatifid-lyrate or serrate at the base becoming dentate towards the apex and each lobe frequently dentate, obtuse, quite glabrous or nearly so except for some villous wool in the axils. *Peduncles* ascending to erect, up to 50 cm. tall, terete, glabrous except for some villous wool in the axils of the bracts. *Bracteoles* free, or connate at extreme base, ovate-elliptic to linear, entire or minutely dentate, glabrous; lower ones 4–15 cm. long, 1–4 mm. wide; upper ones smaller and narrower. Centre flowers on pedicels 5–15 mm. long. *Sepals* 3, completely free or nearly so, cordate, glabrous outside, villous inside or rarely quite glabrous, entire or with a few narrow teeth towards the base, acute; posterior one very distinctly cordate at the base, broad-ovate to narrow ovate, 4–8 mm. long, 2–8 mm. wide; lateral ones narrower. *Corolla* yellow with an obscure anterior pocket, sparsely to densely pubescent outside but for the wings, slightly pubescent or villous inside, adnate to the ovary to just above the midmark; tube 3–4 mm. long; superior lobes narrow-obovate, 4–8 mm. long, 1–2 mm. wide, broadly (1 mm. wide) winged with prominent auricles c. 1 mm. wide which are barbulate on the margin; inferior lobes 3–6 mm. long, 1–2 mm. wide, also broadly winged; connate part of inferior lobes 3–5 mm. long with small enations. *Stamens* 5: filaments narrow-linear, 2–3 mm. long; anthers linear, 1–2 mm. long, obtuse. *Ovary* ovoid to globular, pubescent in upper part with a dissepiment reaching the mid-mark bearing 4–10 ovules; style 2–4 mm. long with scattered villous hairs; indusium  $\pm$  erect, slightly folded with villous hairs on both surfaces, very-broad-ovate, 1–2 mm. wide with a slightly curved orifice beset with prominent white bristles. *Capsule* ovoid to sub-globular, 3–6 mm. diam., glabrous or pubescent,  $\pm$  equally 4-valved. *Seeds* flat orbicular to elliptic, 1–2.5 mm. wide, minutely punctulate, surrounded by a very narrow rim.

*Range*: Central coast of N.S.W.

*Habitat*: Swamps and other wet sites on sandstone.

*Chromosome number*:  $n = 8$ .

*Discussion*: Distinguished from *V. spathulata* by the glabrous peduncles and the cordate posterior sepal and from *V. parvisepata* by free, cordate sepals.

Hamilton (*Austr. Nat.*, 2:212(1913)) noted that specimens of "*V. spathulata*" from National Park were quite different from those occurring at Narrabeen. In fact the National Park specimens are a form of *V. lyrata* with shorter corolla, narrower posterior sepal and fewer (4) ovules per ovary. All these characters, however, appear to intergrade with those of the typical form and consequently it does not seem appropriate to raise this variation to taxonomic rank. A specimen from the Clarence River (NSW 75585) is placed in this species but the pedicels are definitely pubescent and in its narrower sepals and leafy basal bracts it shows some resemblance to *V. macrocalyx*.



*Typification: V. lyrata* Lectotype—South Head of Port Jackson, R. Brown 1803 (BM)—*Isotype* (P).

*Selected specimens examined: New South Wales.* Mangrove Mt., K. Mair, 22.1.1948 (NSW 5247): Wondabyne, W. F. Blakely and D. W. C. Shiress, 9.1.1923 (NSW 75699): Mt. White, W. J. Peacock, 5.11.1958 (SYD\*): Bowen's Creek, R. Carolin, 20 Nov. 1958 (SYD): Glenbrook, H. S. McKee, no. 6751, 4.1.1959 (SYD): Manly, J. J. Fletcher, Nov. 3 1889 (NSW 75698): Middle Head, J. H. Forrest, Aug. 1892 (BRI 058821): Woolloomooloo, A. Cunningham, Jan. 3 1817 (BM): Sutherland, O. D. Evans, 8.1.1914 (SYD): Waterfall, A. A. Hamilton, 6.1.1914 (NSW 75668): Sublime Point, G. Rodway, no. 1336, 22.4.1934 (NSW 75667): National Park, A. A. Hamilton, March 1900 (NSW 75669).



Fig. 10. Distribution of *V. macrocalyx* (O), *V. montana* (●) and *V. daviesii* (+).

### 15. *V. PARVISEPTA*, sp. nov.

Herba perennis. Folia dentata glabra. Bracteolae lineares vel lineari-angusto-ovatae. Sepala 3 connata basin versus, extus glabra, elliptica. Corolla flava, 8–12 mm. longa sacco brevi antico: lobi antichi parte connato partem liberum plus minusve aequanti. Indusium depresso ovatum vel fere semi-circulare. Semina margine angusto.

Perennial herb with a strong tap-root and caulorrhiza covered with dead leaf-bases. *Leaves* arranged in an ascending basal cluster or rosette, narrow-obovate-elliptic narrowing very gradually into a linear  $\pm$  concave petiole with a broad base, 8–15 cm. long, 8–20 mm. wide, thick, dentate to shallowly incised, acute or obtuse, glabrous except for a few axillary hairs. *Peduncles* erect or ascending up to 40 cm. tall, glabrous, smooth. *Bracteoles* free or very shortly connate at the base, linear to linear-narrow-obovate, up to 10 mm. long and 2 mm. wide, acute, entire, glabrous but for some axillary villous hairs. *Sepals* 3, free except right at the base, not cordate at the base, glabrous outside but villous-pubescent inside, entire: posterior one elliptic to elliptic-

*Typification: V. lyrata* Lectotype—South Head of Port Jackson, R. Brown 1803 (BM)—*Isotype* (P).

*Selected specimens examined: New South Wales.* Mangrove Mt., K. Mair, 22.1.1948 (NSW 5247): Wondabyne, W. F. Blakely and D. W. C. Shiress, 9.1.1923 (NSW 75699): Mt. White, W. J. Peacock, 5.11.1958 (SYD\*): Bowen's Creek, R. Carolin, 20 Nov. 1958 (SYD): Glenbrook, H. S. McKee, no. 6751, 4.1.1959 (SYD): Manly, J. J. Fletcher, Nov. 3 1889 (NSW 75698): Middle Head, J. H. Forrest, Aug. 1892 (BRI 058821): Woolloomooloo, A. Cunningham, Jan. 3 1817 (BM): Sutherland, O. D. Evans, 8.1.1914 (SYD): Waterfall, A. A. Hamilton, 6.1.1914 (NSW 75668): Sublime Point, G. Rodway, no. 1336, 22.4.1934 (NSW 75667): National Park, A. A. Hamilton, March 1900 (NSW 75669).



Fig. 10. Distribution of *V. macrocalyx* (O), *V. montana* (●) and *V. daviesii* (+).

### 15. *V. PARVISEPTA*, sp. nov.

Herba perennis. Folia dentata glabra. Bracteolae lineares vel lineari-angusto-ovatae. Sepala 3 connata basin versus, extus glabra, elliptica. Corolla flava, 8–12 mm. longa sacco brevi antico: lobi antichi parte connato partem liberum plus minusve aequanti. Indusium depresso ovatum vel fere semicirculare. Semina margine angusto.

Perennial herb with a strong tap-root and caulorrhiza covered with dead leaf-bases. *Leaves* arranged in an ascending basal cluster or rosette, narrow-obovate-elliptic narrowing very gradually into a linear  $\pm$  concave petiole with a broad base, 8–15 cm. long, 8–20 mm. wide, thick, dentate to shallowly incised, acute or obtuse, glabrous except for a few axillary hairs. *Peduncles* erect or ascending up to 40 cm. tall, glabrous, smooth. *Bracteoles* free or very shortly connate at the base, linear to linear-narrow-obovate, up to 10 mm. long and 2 mm. wide, acute, entire, glabrous but for some axillary villous hairs. *Sepals* 3, free except right at the base, not cordate at the base, glabrous outside but villous-pubescent inside, entire: posterior one elliptic to elliptic-



oblong, 7–8 mm. long, 2–3 mm. wide, acute to acuminate: anterior-lateral ones narrow-elliptic, 6 mm. long, 1.5 mm. wide. *Corolla* yellow, 8–12 mm. long with a short anterior pouch, adnate to the ovary usually above the mid-mark, pubescent outside but for the lateral wings, glabrous or nearly so inside with distinct enations: tube 2–3 mm. long: superior lobes falcate-narrow-obovate, 4–5 mm. long, 1.5 mm. wide, broadly (2 mm.) winged with prominent barbulate auricles: inferior ones narrow-ovate, 4 mm. long, 1.5 mm. wide, broadly winged; connate part of inferior lobes 3 mm. long. *Stamens* 5: filaments linear, 2 mm. long; anthers oblong, 1 mm. long, minutely apiculate. *Ovary* globular to ovoid, glabrous or nearly so with a very short dissepiment bearing 6–8 ovules: style c. 2 mm. long, covered with scattered villous hairs especially towards the top: indusium depressed-ovate to almost semi-circular, c. 1 mm. wide, villous, incurved to folded with a  $\pm$  curved orifice beset with long white bristles on the upper lip becoming shorter at the sides and on the lower lip. *Capsule* sub-globular, 4–5 mm. diam., glabrous with a minute mucro, 4-valved to the base. *Seeds* pale-brown, orbicular, 2 mm. diam. with a narrow-mucilaginous margin.



Fig. 11. Distribution of *V. lyrata* (●) and *V. parvisecta* (+).

*Range*: Western Slopes of N.S.W.

*Habitat*: Forests and woodlands, mostly on sandy soils.

*Chromosome number*: Unknown.

*Typification*: *Holotype*—Dubbo, J. Peacock, 8.11.1960 (NSW100660).

*Discussion*: Differs from *V. spatulata* in the glabrous peduncles and pedicels, narrower leaves, distinctly barbulate auricles and the very short dissepiment. It also shows similarities with *V. lyrata* from which it is readily distinguished by the cordate, wider sepals of the latter.

*Specimens examined*: *New South Wales*: Goonoo Forest, Eumungerie, G. Chippendale and E. Constable, 26.9.1951 (NSW 17367); Goonoo Forest, A. G. Graham, 24.1.1959 (NSW 75710) Warrumbungle Ranges. W. Forsyth, Oct. 1901 (NSW 75696).

oblong, 7–8 mm. long, 2–3 mm. wide, acute to acuminate: anterior-lateral ones narrow-elliptic, 6 mm. long, 1.5 mm. wide. *Corolla* yellow, 8–12 mm. long with a short anterior pouch, adnate to the ovary usually above the mid-mark, pubescent outside but for the lateral wings, glabrous or nearly so inside with distinct enations: tube 2–3 mm. long: superior lobes falcate-narrow-obovate, 4–5 mm. long, 1.5 mm. wide, broadly (2 mm.) winged with prominent barbulate auricles: inferior ones narrow-ovate, 4 mm. long, 1.5 mm. wide, broadly winged; connate part of inferior lobes 3 mm. long. *Stamens* 5: filaments linear, 2 mm. long; anthers oblong, 1 mm. long, minutely apiculate. *Ovary* globular to ovoid, glabrous or nearly so with a very short dissepiment bearing 6–8 ovules: style c. 2 mm. long, covered with scattered villous hairs especially towards the top: indusium depressed-ovate to almost semi-circular, c. 1 mm. wide, villous, incurved to folded with a  $\pm$  curved orifice beset with long white bristles on the upper lip becoming shorter at the sides and on the lower lip. *Capsule* sub-globular, 4–5 mm. diam., glabrous with a minute mucro, 4-valved to the base. *Seeds* pale-brown, orbicular, 2 mm. diam. with a narrow-mucilaginous margin.



Fig. 11. Distribution of *V. lyrata* (●) and *V. parvisepta* (+).

*Range*: Western Slopes of N.S.W.

*Habitat*: Forests and woodlands, mostly on sandy soils.

*Chromosome number*: Unknown.

*Typification*: *Holotype*—Dubbo, J. Peacock, 8.11.1960 (NSW100660).

*Discussion*: Differs from *V. spathulata* in the glabrous peduncles and pedicels, narrower leaves, distinctly barbulate auricles and the very short dissepiment. It also shows similarities with *V. lyrata* from which it is readily distinguished by the cordate, wider sepals of the latter.

*Specimens examined*: *New South Wales*: Goonoo Forest, Eumungerie, G. Chippendale and E. Constable, 26.9.1951 (NSW 17367); Goonoo Forest, A. G. Graham, 24.1.1959 (NSW 75710) Warrumbungle Ranges. W. Forsyth, Oct. 1901 (NSW 75696).



16. *V. SPATHULATA* R.Br.

*Prodr.*, 580(1810): DC. *Prodr.*, 7:518(1839): De Vriese, *Gooden.*, 174 (1854): Benth., *Fl. Austr.*, 4:50(1869): Moore et Betche., *Hdbk. Fl. N.S.W.*, 310(1893): Bailey, *Qld. Fl.*, 3:894(1900); Krause in *Pflrch.*, 54:29(1912): Merrill et Perry in *Journ. Arn. Arb.*, 22:387(1941): van Steenis in *Blumea*, 7:597(1954): Leenhouts in *Fl. Males.*, 5:336(1957).

Perennial herb with a thin tap root and a conspicuous caulorrhiza covered with dead leaf-bases up to 1 cm. thick and 3 cm. long. *Leaves* arranged in a spreading or prostrate rosette, thick and often fleshy, narrow-obovate to obovate narrowing very gradually into a broad petiole up to 10 cm. long (incl. the petiole), 0.5–2.5 cm. wide, entire sinuate or with short blunt teeth, obtuse, glabrous or glabrescent with some pale brown villous hairs in the axils. *Peduncles* prostrate to weakly ascending, 7–25 cm. long, terete with retrorse-appressed or reflexed  $\pm$  villous hairs. *Bracteoles free*: lower ones narrow-ovate or elliptic to linear up to 12 mm. long and 3 mm. wide, acute to obtuse, glabrous with a few villous hairs in the axils. Centre flowers on pedicels 5 cm. long. *Sepals* 3, free, cordate or scarcely so, acute or even slightly acuminate, entire or with a few blunt teeth towards the base, glabrous or glabrescent on the outer surface,  $\pm$  densely covered with appressed villous hairs on the inner surface especially towards the top: posterior ones ovate or narrow-ovate to oblong, 4–7 mm. long, 2–3 mm. wide: lateral ones narrower and slightly shorter. *Corolla* yellow often with brownish-purple markings and a short anterior pocket, pubescent on the outside but for the wings, adnate to the ovary up to the mid-point or further: tube 2 mm. long: superior lobes falcate-narrow-ovate, 4–6 mm. long, 1–2 mm. wide, broadly (c. 1 mm. wide) winged with prominent auricles c. 1 mm. wide which are minutely ciliate at the margin: inferior lobes ovate to elliptic, 2–4 mm. long, c. 1 mm. wide with broad (1 mm.) lateral wings; connate part of inferior lobes 2–3.5 mm. long with some small enations. *Stamens* 5: filaments linear-filiform, c. 2 mm. long; anthers oblong, c. 1 mm. long with a minute incurved mucro. *Ovary* ovoid, minutely pubescent with a dissepiment reaching to mid-mark and bearing 18–24 ovules: indusium slightly curved and slightly folded with a few short scattered hairs, semi-orbicular, c. 1 mm. long and 1 mm. wide with a  $\pm$  curved orifice bearing on the upper lip short cilia: stigma 2-lobed. *Capsule* ovoid, c. 4 mm. long, acute or slightly acuminate,  $\pm$  equally 4-valved, almost glabrous. *Seeds* flat, orbicular, 1.5 mm. diam., minutely punctulate with scarcely any rim at all.

*Range*: Eastern coast of Australia from Port Jackson northwards and into Western Division of Papua and the Louisiade Archipelago.

*Habitat*: Damp soil, mostly sandy.

*Chromosome number*:  $n = 8$ .

*Typification*: There are two sheets in K from R.Br.'s Collection: one bears two R.Br. collections but is labelled only with Bennett's labels: "Shoal Water Bay" and "Newcastle". The other is mounted on the same sheet as "Brisbane River, Ferd. Mueller, Dec. 1856" and is labelled with one of Brown's own labels "Newcastle District" and "Keppil Bay Port I and c". The R.Br. material in BM is mounted all on the same sheet. The uppermost collection, is herewith selected as the lectotype. *Lectotype*—R. Brown, Kingstown, Newcastle, Oct.-Nov. 1804 (BM) *Isotype*: MEL 9776 (pro parte).

*Discussion*: This species can be distinguished from *V. lyrata* by the narrower sepals and the appressed villous hairs on the peduncles and pedicels. It differs from *V. pubescens* principally in the indumentum of the peduncle and pedicel of the latter the hairs of which are pubescent and spreading.

16. *V. SPATHULATA* R.Br.

*Prodr.*, 580(1810): DC. *Prodr.*, 7:518(1839): De Vriese, *Gooden.*, 174 (1854): Benth., *Fl. Austr.*, 4:50(1869): Moore et Betche., *Hdbk. Fl. N.S.W.*, 310(1893): Bailey, *Qld. Fl.*, 3:894(1900); Krause in *Pflrch.*, 54:29(1912): Merrill et Perry in *Journ. Arn. Arb.*, 22:387(1941): van Steenis in *Blumea*, 7:597(1954): Leenhouts in *Fl. Males.*, 5:336(1957).

Perennial herb with a thin tap root and a conspicuous caulorrhiza covered with dead leaf-bases up to 1 cm. thick and 3 cm. long. *Leaves* arranged in a spreading or prostrate rosette, thick and often fleshy, narrow-obovate to obovate narrowing very gradually into a broad petiole up to 10 cm. long (incl. the petiole), 0.5–2.5 cm. wide, entire sinuate or with short blunt teeth, obtuse, glabrous or glabrescent with some pale brown villous hairs in the axils. *Peduncles* prostrate to weakly ascending, 7–25 cm. long, terete with retrorse-appressed or reflexed  $\pm$  villous hairs. *Bracteoles free*: lower ones narrow-ovate or elliptic to linear up to 12 mm. long and 3 mm. wide, acute to obtuse, glabrous with a few villous hairs in the axils. Centre flowers on pedicels 5 cm. long. *Sepals* 3, free, cordate or scarcely so, acute or even slightly acuminate, entire or with a few blunt teeth towards the base, glabrous or glabrescent on the outer surface,  $\pm$  densely covered with appressed villous hairs on the inner surface especially towards the top: posterior ones ovate or narrow-ovate to oblong, 4–7 mm. long, 2–3 mm. wide: lateral ones narrower and slightly shorter. *Corolla* yellow often with brownish-purple markings and a short anterior pocket, pubescent on the outside but for the wings, adnate to the ovary up to the mid-point or further: tube 2 mm. long: superior lobes falcate-narrow-ovate, 4–6 mm. long, 1–2 mm. wide, broadly (c. 1 mm. wide) winged with prominent auricles c. 1 mm. wide which are minutely ciliate at the margin: inferior lobes ovate to elliptic, 2–4 mm. long, c. 1 mm. wide with broad (1 mm.) lateral wings; connate part of inferior lobes 2–3.5 mm. long with some small enations. *Stamens* 5: filaments linear-filiform, c. 2 mm. long; anthers oblong, c. 1 mm. long with a minute incurved mucro. *Ovary* ovoid, minutely pubescent with a dissepiment reaching to mid-mark and bearing 18–24 ovules: indusium slightly curved and slightly folded with a few short scattered hairs, semi-orbicular, c. 1 mm. long and 1 mm. wide with a  $\pm$  curved orifice bearing on the upper lip short cilia: stigma 2-lobed. *Capsule* ovoid, c. 4 mm. long, acute or slightly acuminate,  $\pm$  equally 4-valved, almost glabrous. *Seeds* flat, orbicular, 1.5 mm. diam., minutely punctulate with scarcely any rim at all.

*Range*: Eastern coast of Australia from Port Jackson northwards and into Western Division of Papua and the Louisiade Archipelago.

*Habitat*: Damp soil, mostly sandy.

*Chromosome number*:  $n = 8$ .

*Typification*: There are two sheets in K from R.Br.'s Collection: one bears two R.Br. collections but is labelled only with Bennett's labels: "Shoal Water Bay" and "Newcastle". The other is mounted on the same sheet as "Brisbane River, Ferd. Mueller, Dec. 1856" and is labelled with one of Brown's own labels "Newcastle District" and "Keppil Bay Port I and c". The R.Br. material in BM is mounted all on the same sheet. The uppermost collection, is herewith selected as the lectotype. *Lectotype*—R. Brown, Kingstown, Newcastle, Oct.-Nov. 1804 (BM) *Isotype*: MEL 9776 (pro parte).

*Discussion*: This species can be distinguished from *V. lyrata* by the narrower sepals and the appressed villous hairs on the peduncles and pedicels. It differs from *V. pubescens* principally in the indumentum of the peduncle and pedicel of the latter the hairs of which are pubescent and spreading.



*Selected specimens examined: Papua:* Joe Landing, Sudest Isl. L. J. Brass, no. 27757, 19 Aug. 1956 (CANB 56768. K.L.): Dagura, Orioma River, Western Division, L. J. Brass, no. 5931, Feb.–March 1934 (K.L.). *Queensland:* Cape York Peninsula, W. Hann, no. 263 and 264, Dec. 1873 (K): Endeavour River, Allan Cunningham, no. 19, 1820 (BM): Atherton, E. Betche, 8.1901 (NSW 75691); Elimbah, H. S. McKee, no. 9734, 4.12.1962 (CANB 118014. NSW 75685): Port Douglas, Dr. Lucas (MEL 9792): Hinchinbrook Island, J. Dallachy, 9 Nov. 1847 (MEL 9784): Rockhampton, A. Thozet, 1875 (MEL 9773): Fraser Island, F. C. Epps, no. 137, June 1919 (BRI 058766): Cabool-

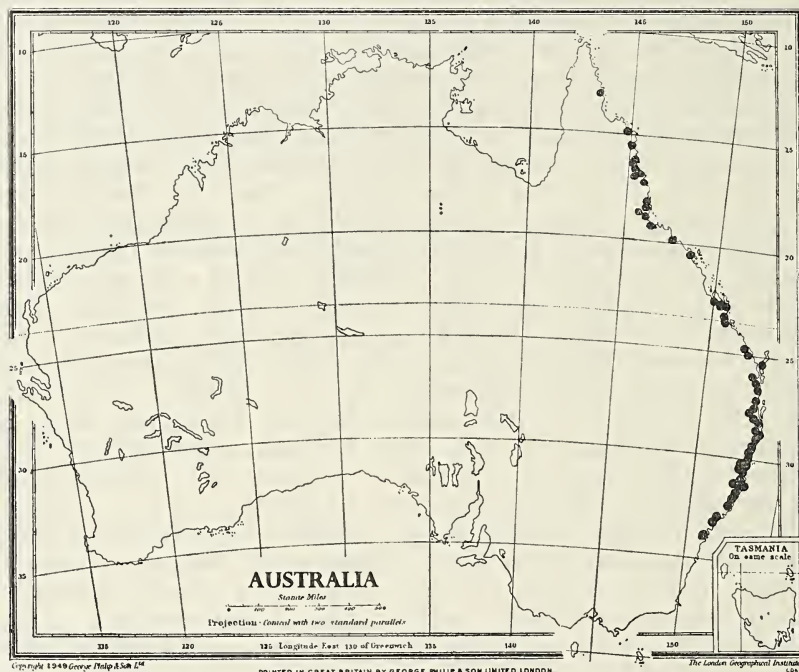


Fig. 12. Distribution of *V. spathulata* (●).

ture, R. Carolin, no. 569, 15.5.1958 (SYD): Coolum Beach, Moreton Distr., M. S. Clemens, 4 April 1945: (K) 10 miles N. of Southport, J. Peacock, no. 611.22.3, 21.1.1961 (SYD\*): *New South Wales:* Barcoonger State Forest, W. J. Peacock, no. 6012.2.4, 10.12.1960 (SYD\*): Port Macquarie, J. L. Boorman, June 1915 (SYD):  $\frac{1}{2}$  mile from Pacific Highway on Budgewoi Rd., W. J. Peacock, no. 611.24.2, 31.1.1961 (SYD\*): Narrabeen Swamps, A. A. Hamilton, 4.1901 (NSW 75670).

#### 17. *V. PUBESCENS* R.Br.

*Prodr.*, 581 (1810): D.C., *Prodr.*, 7: 518 (1839): Benth., *Fl. Austr.*, 4: 50 (1869): Bailey, *Qld. Fl.*, 3894 (1900): Krause in *Pflrch.*, 54: 31 (1912).

Perennial herb with a thin tap root and conspicuous caulorrhiza covered with dead leaf-bases. *Leaves* arranged in a spreading rosette, elliptic to narrow-obovate, narrowing gradually into a short petiole 5–12 cm. long, (incl. petiole) 12–25 mm. wide, shortly dentate, obtuse, pubescent with simple hairs especially on lower surface and with some long white villous wool in the axils. *Peduncles* ascending to decumbent, up to 15 cm. tall, pubescent with short simple patent hairs. *Bractcoles* free; lower ones oblong-elliptic to narrow-oblancoate, up to 3 cm. long and 10 mm. wide, dentate, pubescent,  $\pm$  acute with some villous wool in the axils: upper ones becoming smaller and narrower. Centre flowers on pedicels 5–20 mm. long. *Sepals* 3, free;

*Selected specimens examined:* Papua: Joe Landing, Sudest Isl. L. J. Brass, no. 27757, 19 Aug. 1956 (CANB 56768. K.L.): Dagura, Orioma River, Western Division, L. J. Brass, no. 5931, Feb.–March 1934 (K.L.). Queensland: Cape York Peninsula, W. Hann, no. 263 and 264, Dec. 1873 (K): Endeavour River, Allan Cunningham, no. 19, 1820 (BM): Atherton, E. Betche, 8.1901 (NSW 75691); Elimbah, H. S. McKee, no. 9734, 4.12.1962 (CANB 118014. NSW 75685): Port Douglas, Dr. Lucas (MEL 9792): Hinchinbrook Island, J. Dallachy, 9 Nov. 1847 (MEL 9784): Rockhampton, A. Thozet, 1875 (MEL 9773): Fraser Island, F. C. Epps, no. 137, June 1919 (BRI 058766): Cabool-

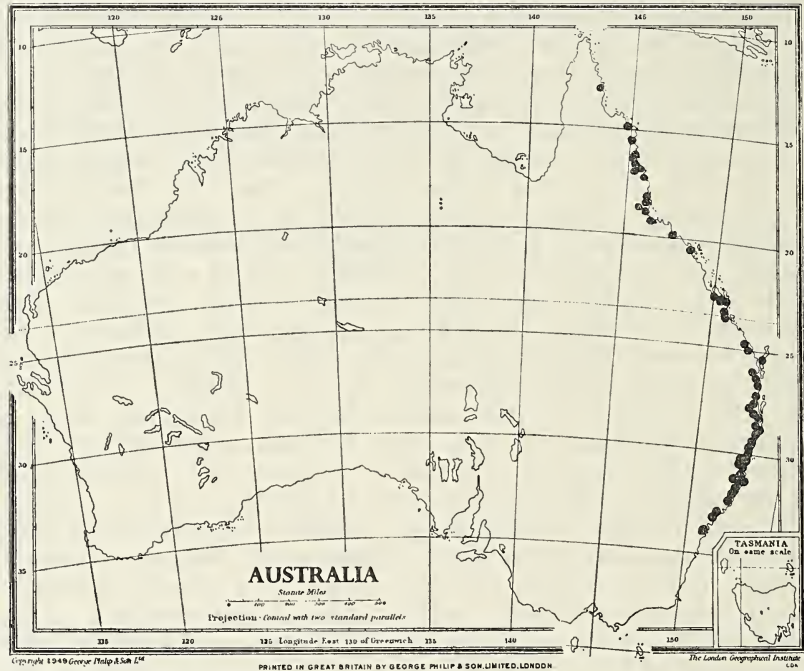


Fig. 12. Distribution of *V. spathulata* (●).

ture, R. Carolin, no. 569, 15.5.1958 (SYD): Coolum Beach, Moreton Distr., M. S. Clemens, 4 April 1945: (K) 10 miles N. of Southport, J. Peacock, no. 611.22.3, 21.1.1961 (SYD\*): New South Wales: Barcoonger State Forest, W. J. Peacock, no. 6012.2.4, 10.12.1960 (SYD\*): Port Macquarie, J. L. Boorman, June 1915 (SYD):  $\frac{1}{2}$  mile from Pacific Highway on Budgewoi Rd., W. J. Peacock, no. 611.24.2, 31.1.1961 (SYD\*): Narrabeen Swamps, A. A. Hamilton, 4.1901 (NSW 75670).

#### 17. *V. PUBESCENS* R.Br.

*Prodr.*, 581 (1810): D.C., *Prodr.*, 7: 518 (1839): Benth., *Fl. Austr.*, 4: 50 (1869): Bailey, *Qld. Fl.*, 3894 (1900): Krause in *Pflrch.*, 54: 31 (1912).

Perennial herb with a thin tap root and conspicuous caulorrhiza covered with dead leaf-bases. *Leaves* arranged in a spreading rosette, elliptic to narrow-obovate, narrowing gradually into a short petiole 5–12 cm. long, (incl. petiole) 12–25 mm. wide, shortly dentate, obtuse, pubescent with simple hairs especially on lower surface and with some long white villous wool in the axils. *Peduncles* ascending to decumbent, up to 15 cm. tall, pubescent with short simple patent hairs. *Bractcoles* free; lower ones oblong-elliptic to narrow-oblancoate, up to 3 cm. long and 10 mm. wide, dentate, pubescent,  $\pm$  acute with some villous wool in the axils: upper ones becoming smaller and narrower. Centre flowers on pedicels 5–20 mm. long. *Sepals* 3, free;



sometimes slightly cordate, pubescent with spreading hairs on outer surface and  $\pm$  appressed ones on inner surface, acute to obtuse, entire or with a few blunt teeth towards the base: posterior one ovate-elliptic, 6.5–11 mm. long, 4–7 mm. wide: lateral ones narrower. *Corolla* yellow with a short anterior pocket, pubescent outside but for the wings, adnate to the ovary to just below the mid-mark: tube 3 mm. long: superior lobes narrow-oblongate, 5–15 mm. long, 1–2 mm. wide, broadly (c. 1 mm. wide) winged with prominent auricles c. 1 mm. wide which are sparsely barbulate on the margin: inferior lobes narrow-elliptic, 2.5–5 mm. long, 1–2 mm. wide with broad (1 mm. wide) lateral wings: connate part of inferior lobes 3.5–6 mm. long with some small enations. *Stamens* 5: filaments linear-filiform 2–4 mm. long: anthers narrow-oblong c. 1 mm. long, minutely apiculate. *Ovary* ovoid, pubescent with a dissepiment reaching to about the mid-mark and bearing c. 20 ovules: style 5–7 mm. long with scattered villous hairs: indusium depressed-obovate, slightly folded and curved covered with scattered  $\pm$  appressed hairs and with a curved orifice bearing short (c. 0.3 mm.) cilia. *Capsule* sub-globular to ovoid, 4–6 mm. diam., minutely pubescent or glabrous above, 4-valved. *Seeds* flat, orbicular to elliptic, c. 2 mm. diam., punctulate with scarcely any rim at all.

*Range*: Tropical Queensland, east of the Divide.

*Habitat*: Unknown.

*Chromosome number*: Unknown.

*Typification*: There are two sheets of R.Br. material at K, both labelled "East Coast, Shoalwater Bay and Broad Sounds". Also an extremely pubescent specimen "Burdekin riv. Dallachy Herb. F. Mueller" "Vellea abessam F. Muel."! At BM two gatherings are mounted on the same sheet in such a manner that it is impossible to decide which label applies to which specimen. Fortunately there seems little doubt that they are conspecific. *Syntypes*: Shoalwater Bay, R. Brown no. 87 et Shoalwater Bay, Thirsty Sound, Broad Sound, R. Brown, same number (BM): *Isotypes* (P. MEL 9796).

*Discussion*: This species is very similar to *V. spathulata*. However, the pubescent leaves and calyx, the generally broader posterior sepal and the longer more oblong indusium serve to distinguish it. The illustration of the corolla in Krause is misleading since the wings are shown as being very narrow. This is not the case although in herbarium specimens these wings are frequently eaten by insects.

*Selected specimens examined*: Queensland. Bay of Inlets, Banks and Solander, 1770 (BM): Broad Sound, E. Bowan, 1871 (MEL 9794).

#### 18. *V. MACROCALYX* De Vriese

In Mitch., *Journ. Exp. Trop. Austr.*, 258(1848) et De Vriese in *Gooden.*, 176(1854) t.34: Benth., *Fl. Austr.*, 4: 49(1869): Bailey, *Qld. Fl.*, 3: 893(1900): Krause in *Pflrch.*, 54: 29(1912).

*Taxonomic synonym*: *V. prostrata* Ewart et Kerr in Proc. Roy. Soc. Vict. n.s., 39:7(1936).

Perennial herb with a long  $\pm$  stout tap root and a large woody caulorrhiza bearing dead leaf-bases. *Leaves* all basal, inserted on the caulorrhiza, elliptic to narrow-obovate, tapering gradually in a long (2–4 cm.) petiole, 5–15 cm. long (incl. petiole), 2–4 cm. wide, entire or dentate towards the base, obtuse,  $\pm$  thick, glabrous but for some conspicuous wool in the axils. *Peduncles* ascending or decumbent, up to 35 cm. long, terete, glabrous showing a definite tendency for one of the dichotomies to grow more strongly than the other (c.f. *V. panduriformis*). *Bracteoles* free: lower bracts linear to elliptic, 5–40 mm. long, 1–25 mm. wide, entire or nearly so, glabrous but for a little wool in the axils, acute or obtuse, free: upper bracts becoming smaller. Central flowers on pedicels up to 1 cm. long; all pedicels with a line of hairs

sometimes slightly cordate, pubescent with spreading hairs on outer surface and  $\pm$  appressed ones on inner surface, acute to obtuse, entire or with a few blunt teeth towards the base: posterior one ovate-elliptic, 6.5–11 mm. long, 4–7 mm. wide: lateral ones narrower. *Corolla* yellow with a short anterior pocket, pubescent outside but for the wings, adnate to the ovary to just below the mid-mark: tube 3 mm. long: superior lobes narrow-oblongate, 5–15 mm. long, 1–2 mm. wide, broadly (c. 1 mm. wide) winged with prominent auricles c. 1 mm. wide which are sparsely barbulate on the margin: inferior lobes narrow-elliptic, 2.5–5 mm. long, 1–2 mm. wide with broad (1 mm. wide) lateral wings: connate part of inferior lobes 3.5–6 mm. long with some small enations. *Stamens* 5: filaments linear-filiform 2–4 mm. long: anthers narrow-oblong c. 1 mm. long, minutely apiculate. *Ovary* ovoid, pubescent with a dissepiment reaching to about the mid-mark and bearing c. 20 ovules: style 5–7 mm. long with scattered villous hairs: indusium depressed-obovate, slightly folded and curved covered with scattered  $\pm$  appressed hairs and with a curved orifice bearing short (c. 0.3 mm.) cilia. *Capsule* sub-globular to ovoid, 4–6 mm. diam., minutely pubescent or glabrous above, 4-valved. *Seeds* flat, orbicular to elliptic, c. 2 mm. diam., punctulate with scarcely any rim at all.

*Range*: Tropical Queensland, east of the Divide.

*Habitat*: Unknown.

*Chromosome number*: Unknown.

*Typification*: There are two sheets of R.Br. material at K, both labelled "East Coast, Shoalwater Bay and Broad Sounds". Also an extremely pubescent specimen "Burdekin riv. Dallachy Herb. F. Mueller" "Vellea abessam F. Muel."! At BM two gatherings are mounted on the same sheet in such a manner that it is impossible to decide which label applies to which specimen. Fortunately there seems little doubt that they are conspecific. *Syntypes*: Shoalwater Bay, R. Brown no. 87 et Shoalwater Bay, Thirsty Sound, Broad Sound, R. Brown, same number (BM): *Isotypes* (P. MEL 9796).

*Discussion*: This species is very similar to *V. spathulata*. However, the pubescent leaves and calyx, the generally broader posterior sepal and the longer more oblong indusium serve to distinguish it. The illustration of the corolla in Krause is misleading since the wings are shown as being very narrow. This is not the case although in herbarium specimens these wings are frequently eaten by insects.

*Selected specimens examined*: Queensland. Bay of Inlets, Banks and Solander, 1770 (BM): Broad Sound, E. Bowan, 1871 (MEL 9794).

#### 18. *V. MACROCALYX* De Vriese

In Mitch., *Journ. Exp. Trop. Austr.*, 258(1848) et De Vriese in *Gooden.*, 176(1854) t.34: Benth., *Fl. Austr.*, 4: 49(1869): Bailey, *Qld. Fl.*, 3: 893(1900): Krause in *Pflrch.*, 54: 29(1912).

*Taxonomic synonym*: *V. prostrata* Ewart et Kerr in Proc. Roy. Soc. Vict. n.s., 39:7(1936).

Perennial herb with a long  $\pm$  stout tap root and a large woody caulorrhiza bearing dead leaf-bases. *Leaves* all basal, inserted on the caulorrhiza, elliptic to narrow-obovate, tapering gradually in a long (2–4 cm.) petiole, 5–15 cm. long (incl. petiole), 2–4 cm. wide, entire or dentate towards the base, obtuse,  $\pm$  thick, glabrous but for some conspicuous wool in the axils. *Peduncles* ascending or decumbent, up to 35 cm. long, terete, glabrous showing a definite tendency for one of the dichotomies to grow more strongly than the other (c.f. *V. panduriformis*). *Bracteoles* free: lower bracts linear to elliptic, 5–40 mm. long, 1–25 mm. wide, entire or nearly so, glabrous but for a little wool in the axils, acute or obtuse, free: upper bracts becoming smaller. Central flowers on pedicels up to 1 cm. long; all pedicels with a line of hairs



arising from between the two lateral sepals. *Sepals* 3, free, bases not cordate and frequently decurrent on the pedicel, glabrous on the outer surface but pubescent on the inner surface with  $\pm$  appressed hairs, elliptic to ovate, c. 10 mm. long and 5 mm. wide, entire or with a few teeth towards the base, acuminate to almost obtuse: posterior sepal only very slightly larger than the others. *Corolla* yellow with a very obscure nectary pocket, 10–12 mm. long, closely pubescent on the outer surface, villous to sparsely pubescent towards the base on the inner surface and without prominent enations: tube c. 3 mm. long and adnate to the ovary to about the mid-mark: superior lobes linear-falcate, 9–11 mm. long, 1–1.5 mm. wide with narrow almost obsolete wings and a slightly barbulate auricle 1.5 mm. wide; inferior lobes oblong to narrow-obovate 3–4 mm. long, 2–2.5 mm. wide; connate part of inferior lobes 6–7 mm. long. *Stamens* 5; filaments linear, 2 mm. long; anthers oblong, 1 mm. long. *Ovary* oblong-ovoid, c. 3 mm. long and 1.5 mm. wide, pubescent with a dissepiment reaching to the mid-point and bearing 14–16 ovules: style pubescent, 3–4 mm. long: indusium transverse-oblong, 2 mm. long, 3–5 mm. wide, pubescent, slightly folded, slightly curved with a slightly curved orifice beset on the upper lip with long white bristles but scarcely any on the lower lip. *Capsule* narrow-ovoid 7–8 mm. long, 2–3 mm. wide, pubescent,  $\pm$  acuminate or acute splitting into 4 narrow  $\pm$  equal valves. *Seeds* broad-elliptic, 1.5 mm. wide, minutely punctate, margin  $\pm$  thickened but not winged.

*Range*: Queensland and Northern Territory from the Burdekin River to Barkly Tablelands and Sandover River.

*Habitat*: Savannah.

*Chromosome number*: Unknown.

*Typification*: *V. macrocalyx* De Vriese—*Holotype*—River Belyando—Mitchell (L). *V. prostrata* Ewart and Kerr—*Holotype*—Wycliffe Well, June 1924. A. J. Ewart (MEL 1806).

*Discussion*: Differs from *V. lyrata* most obviously in the habit of the scape in which one branch at each dichotomy grows more strongly than the other giving a panicle like appearance (cf. *V. panduriformis*). It also has narrow wings on the petals and the sepals are not so distinctly cordate.

There is some variation in that the specimens from the Burdekin River area have narrower bracts, the petals are more villous inside, the sepals are almost obtuse and the panicle-like scapes are not well developed. It seems unreasonable to admit these differences to a taxonomic rank with such scanty material.

The illustrations by De Vriese and Ewart are somewhat misleading, particularly the former. Specimens from Herberton (BRI 058783) may belong to this species although the pubescence and habit seem to indicate they do not. More collections are needed before a decision can be made.

*Specimens examined*: *Queensland*: Massacre Inlet, L. J. Brass, no. 190, Aug. 1922 (CANB 23741. BRI 058756): Burdekin, Mueller (MEL 9720.K). *Northern Territory*: 35 miles N.E. of Alexandria Station, R. A. Perry, no. 1510, 24.6.1948 (CANB 58678 and 109408 and 109407. NT. BRI 017228. NSW 75584. MEL 9719): Argadargada, G. Chippendale, 19.9.1954 (NT 324).

#### 19. *V. PERFOLIATA* R.Br.

*Prodr.*, 581(1810): DC., *Prodr.*, 7: 518(1839): Benth., *Fl. Austr.*, 4: 47 (1869): Moore et Betche, *Hdbk. Fl. N.S.W.*, 309(1893): Krause, in *Pflrch.*, 54: 28(1912).

Perennial herb with a thick strong caulorrhiza covered by dead leaf-bases. *Leaves* arranged in an ascending rosette, elliptic to narrow-obovate, 10–12 cm. long (incl. petiole) 3–4 cm. wide, deeply serrate the teeth each with a short

arising from between the two lateral sepals. *Sepals* 3, free, bases not cordate and frequently decurrent on the pedicel, glabrous on the outer surface but pubescent on the inner surface with  $\pm$  appressed hairs, elliptic to ovate, c. 10 mm. long and 5 mm. wide, entire or with a few teeth towards the base, acuminate to almost obtuse: posterior sepal only very slightly larger than the others. *Corolla* yellow with a very obscure nectary pocket, 10–12 mm. long, closely pubescent on the outer surface, villous to sparsely pubescent towards the base on the inner surface and without prominent enations: tube c. 3 mm. long and adnate to the ovary to about the mid-mark: superior lobes linear-falcate, 9–11 mm. long, 1–1.5 mm. wide with narrow almost obsolete wings and a slightly barbate auricle 1.5 mm. wide; inferior lobes oblong to narrow-obovate 3–4 mm. long, 2–2.5 mm. wide; connate part of inferior lobes 6–7 mm. long. *Stamens* 5; filaments linear, 2 mm. long; anthers oblong, 1 mm. long. *Ovary* oblong-ovoid, c. 3 mm. long and 1.5 mm. wide, pubescent with a dissepiment reaching to the mid-point and bearing 14–16 ovules: style pubescent, 3–4 mm. long: indusium transverse-oblong, 2 mm. long, 3–5 mm. wide, pubescent, slightly folded, slightly curved with a slightly curved orifice beset on the upper lip with long white bristles but scarcely any on the lower lip. *Capsule* narrow-ovoid 7–8 mm. long, 2–3 mm. wide, pubescent,  $\pm$  acuminate or acute splitting into 4 narrow  $\pm$  equal valves. *Seeds* broad-elliptic, 1.5 mm. wide, minutely punctate, margin  $\pm$  thickened but not winged.

*Range*: Queensland and Northern Territory from the Burdekin River to Barkly Tablelands and Sandover River.

*Habitat*: Savannah.

*Chromosome number*: Unknown.

*Typification*: *V. macrocalyx* De Vriese—*Holotype*—River Belyando—Mitchell (L). *V. prostrata* Ewart and Kerr—*Holotype*—Wycliffe Well, June 1924. A. J. Ewart (MEL 1806).

*Discussion*: Differs from *V. lyrata* most obviously in the habit of the scape in which one branch at each dichotomy grows more strongly than the other giving a panicle like appearance (cf. *V. panduriformis*). It also has narrow wings on the petals and the sepals are not so distinctly cordate.

There is some variation in that the specimens from the Burdekin River area have narrower bracts, the petals are more villous inside, the sepals are almost obtuse and the panicle-like scapes are not well developed. It seems unreasonable to admit these differences to a taxonomic rank with such scanty material.

The illustrations by De Vriese and Ewart are somewhat misleading, particularly the former. Specimens from Herberton (BRI 058783) may belong to this species although the pubescence and habit seem to indicate they do not. More collections are needed before a decision can be made.

*Specimens examined*: *Queensland*: Massacre Inlet, L. J. Brass, no. 190, Aug. 1922 (CANB 23741. BRI 058756): Burdekin, Mueller (MEL 9720.K). *Northern Territory*: 35 miles N.E. of Alexandria Station, R. A. Perry, no. 1510, 24.6.1948 (CANB 58678 and 109408 and 109407. NT. BRI 017228. NSW 75584. MEL 9719): Argadargada, G. Chippendale, 19.9.1954 (NT 324).

#### 19. *V. PERFOLIATA* R.Br.

*Prodr.*, 581(1810): DC., *Prodr.*, 7: 518(1839): Benth., *Fl. Austr.*, 4: 47 (1869): Moore et Betche, *Hdbk. Fl. N.S.W.*, 309(1893): Krause, in *Pflrch.*, 54: 28(1912).

Perennial herb with a thick strong caulorrhiza covered by dead leaf-bases. *Leaves* arranged in an ascending rosette, elliptic to narrow-obovate, 10–12 cm. long (incl. petiole) 3–4 cm. wide, deeply serrate the teeth each with a short



blunt mucro, obtuse and terminated by a blunt mucro, glabrous except for some yellow-brown villous wool in the axils, tapering gradually into a short broad petiole with an abruptly broadened scarious base. *Peduncles* erect, c. 30 cm. tall, terete, glabrous, (probably  $\pm$  glaucous). *Bracteoles* connate into disc-like funnels up to 7 cm. diam., conspicuously toothed, each tooth terminated by a short blunt mucro, glabrous except for some wool in the axils. Central flowers on pedicels up to 3.5 cm. long. *Sepals* 3, free, glabrous on outside but villous inside, lacinate serrate or entire towards the base: posterior one broad-elliptic to almost orbicular, 8 mm. long, 7 mm. wide: lateral ones narrower. *Corolla* yellow, with a short anterior pocket, pubescent outside but for the wings, glabrous inside or nearly so, adnate to the ovary to about the mid-mark: superior lobes oblongo-falcate, 6 mm. long, 2 mm. wide, broadly (c. 1 mm.) winged with distinct densely barbulate auricles c. 1 mm. wide: inferior lobes ovate-elliptic, 4 mm. long, 2 mm. wide, broadly winged: connate part of inferior lobes 5 mm. long: tube 5 mm. long with conspicuous enations in the throat. *Stamens* 5: filaments linear, 2 mm. long; anthers narrow-oblong, 2 mm. long, minutely mucronate. *Ovary* ovoid to globular, sparsely pubescent with a dissepiment reaching to about  $\frac{1}{4}$ -mark and bearing c. 10 ovules: style 4–5 mm. long, densely villous towards the top: indusium semi-orbicular, 3 mm. wide, 1 mm. long, villous on the back, densely villous on the front, folded, slightly curved with a more or less straight orifice densely beset with short white cilia. *Capsule*  $\pm$  globular, c. 4 mm. diam.,  $\pm$  equally 4-valved, glabrous. *Seeds* flat, elliptic, c. 3 mm. wide with a very narrow mucilaginous wing, yellow-brown, punctulate.

*Range*: Mainly in the northern parts of the Blue Mts. of N.S.W. and even there rare.

*Habitat*: Unknown.

*Chromosome number*: Unknown.

*Typification*: *V. perfoliata* R.Br.—*Holotype*—A. Gordon, Blue Mountains, 1803 (BM).

*Discussion*: This species is easily distinguished from all others of this section by the connate bracteoles.

*Specimens examined*: *New South Wales*: Blue Mountains Miss Atkinson, no. 29 (MEL 9639. NSW 75695): Wiseman's Ferry, Adelaide Chapman, 8.9.1907 (SYD).

## 20. *V. MONTANA* Hook.f.

In Hook. *Lond. Journ. Bot.*, 6: 265 (1847): et in *Fl. Tasm.*, 234 t.68 (1860): De Vriese, *Gooden.*, 176 (1854): Benth., *Fl. Austr.*, 4: 50 (1869): Moore et Betche, *Hdbk. Fl. N.S.W.*, 310 (1893): Rodway, *Tasm. Fl.*, 101 (1903): Krause in *Pflrch.*, 54: 3 (1912): Ewart, *Fl. Vict.*, 1067 (1931): Curtis, *Stud. Fl. Tasm.*, 2: 399 (1963).

Perennial herb with a narrow tap-root and a short, stout caulorrhiza. *Leaves* arranged in a spreading or prostrate rosette, narrow-obovate to obovate-elliptic gradually narrowing into a short petiole at the base, 1.5–8 cm. long, 6–25 cm. wide, obscurely dentate to almost quite entire, obtuse, villous-pubescent to quite glabrous, with some soft brownish villous hairs in the axils. *Peduncles* decumbent to ascending, up to 10 cm. long but usually much shorter than the leaves, villous-pubescent to glabrous, terete. *Bracteoles*, free, linear to linear-narrow-obovate, up to 5 mm. long, c. 2 mm. wide, villous to pubescent, entire, acute. Central flowers on pedicels up to 5 mm. long. *Sepals* 3, connate right at the base, the tube attenuate, sprinkled with villous hairs on both surfaces, entire,  $\pm$  acute, posterior one ovate or narrow-ovate to oblong, 5–6 mm. long, 2–3 mm. wide: lateral ones slightly narrower. *Corolla* yellow, 7–10 mm. long with an obscure very short anterior pouch, adnate to ovary to about the mid-mark, pubescent outside but for the wings and

blunt mucro, obtuse and terminated by a blunt mucro, glabrous except for some yellow-brown villous wool in the axils, tapering gradually into a short broad petiole with an abruptly broadened scarious base. *Peduncles* erect, c. 30 cm. tall, terete, glabrous, (probably  $\pm$  glaucous). *Bracteoles* connate into disc-like funnels up to 7 cm. diam., conspicuously toothed, each tooth terminated by a short blunt mucro, glabrous except for some wool in the axils. Central flowers on pedicels up to 3.5 cm. long. *Sepals* 3, free, glabrous on outside but villous inside, lacinate serrate or entire towards the base: posterior one broad-elliptic to almost orbicular, 8 mm. long, 7 mm. wide: lateral ones narrower. *Corolla* yellow, with a short anterior pocket, pubescent outside but for the wings, glabrous inside or nearly so, adnate to the ovary to about the mid-mark: superior lobes oblongo-falcate, 6 mm. long, 2 mm. wide, broadly (c. 1 mm.) winged with distinct densely barbulate auricles c. 1 mm. wide: inferior lobes ovate-elliptic, 4 mm. long, 2 mm. wide, broadly winged: connate part of inferior lobes 5 mm. long: tube 5 mm. long with conspicuous enations in the throat. *Stamens* 5: filaments linear, 2 mm. long; anthers narrow-oblong, 2 mm. long, minutely mucronate. *Ovary* ovoid to globular, sparsely pubescent with a dissepiment reaching to about  $\frac{1}{4}$ -mark and bearing c. 10 ovules: style 4–5 mm. long, densely villous towards the top: indusium semi-orbicular, 3 mm. wide, 1 mm. long, villous on the back, densely villous on the front, folded, slightly curved with a more or less straight orifice densely beset with short white cilia. *Capsule*  $\pm$  globular, c. 4 mm. diam.,  $\pm$  equally 4-valved, glabrous. *Seeds* flat, elliptic, c. 3 mm. wide with a very narrow mucilaginous wing, yellow-brown, punctulate.

*Range*: Mainly in the northern parts of the Blue Mts. of N.S.W. and even there rare.

*Habitat*: Unknown.

*Chromosome number*: Unknown.

*Typification*: *V. perfoliata* R.Br.—*Holotype*—A. Gordon, Blue Mountains, 1803 (BM).

*Discussion*: This species is easily distinguished from all others of this section by the connate bracteoles.

*Specimens examined*: *New South Wales*: Blue Mountains Miss Atkinson, no. 29 (MEL 9639. NSW 75695): Wiseman's Ferry, Adelaide Chapman, 8.9.1907 (SYD).

## 20. *V. MONTANA* Hook.f.

In Hook. *Lond. Journ. Bot.*, 6: 265 (1847): et in *Fl. Tasm.*, 234 t.68 (1860): De Vriese, *Gooden.*, 176 (1854): Benth., *Fl. Austr.*, 4: 50 (1869): Moore et Betche, *Hdbk. Fl. N.S.W.*, 310 (1893): Rodway, *Tasm. Fl.*, 101 (1903): Krause in *Pflrch.*, 54: 3 (1912): Ewart, *Fl. Vict.*, 1067 (1931): Curtis, *Stud. Fl. Tasm.*, 2: 399 (1963).

Perennial herb with a narrow tap-root and a short, stout caulorrhiza. *Leaves* arranged in a spreading or prostrate rosette, narrow-obovate to obovate-elliptic gradually narrowing into a short petiole at the base, 1.5–8 cm. long, 6–25 cm. wide, obscurely dentate to almost quite entire, obtuse, villous-pubescent to quite glabrous, with some soft brownish villous hairs in the axils. *Peduncles* decumbent to ascending, up to 10 cm. long but usually much shorter than the leaves, villous-pubescent to glabrous, terete. *Bracteoles*, free, linear to linear-narrow-obovate, up to 5 mm. long, c. 2 mm. wide, villous to pubescent, entire, acute. Central flowers on pedicels up to 5 mm. long. *Sepals* 3, connate right at the base, the tube attenuate, sprinkled with villous hairs on both surfaces, entire,  $\pm$  acute, posterior one ovate or narrow-ovate to oblong, 5–6 mm. long, 2–3 mm. wide: lateral ones slightly narrower. *Corolla* yellow, 7–10 mm. long with an obscure very short anterior pouch, adnate to ovary to about the mid-mark, pubescent outside but for the wings and



pubescent in the throat: tube 4–5 mm. long: superior lobes oblong-elliptic, 2 mm. long, 1 mm. wide with wings about 0.5 mm. long but the auricle almost obsolete: inferior lobes oblong-elliptic, 2 mm. long, 1 mm. wide with conspicuous wings about 0.5 mm. long: connate part of inferior lobes 1 mm. long or less. *Stamens* 5: filaments, linear to filiform, c. 2 mm. long; anthers ovate, 1 mm. long, apiculate. *Ovary* ovoid, minutely pubescent to almost glabrous with a dissepiment reaching to about the mid-mark bearing up to 20 ovules: style about 1 mm. long with a few villous hairs: indusium depressed-ovate, c. 1 mm. across, slightly folded and curved with a slightly curved orifice beset with very short cilia. *Capsule* sub-globular, c. 2 mm. diam. with a few hairs sprinkled over the outer surface,  $\pm$  equally 4-valved. *Seeds* flat, orbicular to elliptic, c. 1.5 mm. diam., very minutely punctulate with an obscure rim.

*Range*: Tasmania and eastern mainland at high altitudes as far north as Barrington Tops.

*Habitat*: Alpine grassland and savannahs in damper places.

*Chromosome number*:  $n = 8$ .

*Typification*: Hooker cites three localities. Labels (and presumably specimens) corresponding to these localities are all affixed to the same sheet at K. The bottom three are selected as the *Lectotype*—Hampshire Hills. Gunn, no. 227, Feb. 1837 (K). N.B. The same number is applied to the Marlborough collection made in 1841 and to an Arthur's Lake collection in 1845, both made by Gunn.

*Discussion*: A very distinct species but very variable with regard to the indumentum. The Tasmanian specimens tend to have narrower sepals and are more glabrous altogether but these are not consistent differences.

*Selected specimens examined*: *New South Wales*: Barrington Tops L. R. Fraser, J. W. Vickery and N. A. Burgess, 7.1.1934 (SYD): Happy Jacks Plain, R. Carolin, no. B99, 10.2.1957 (SYD): Mt. Werong, R. H. Cambage, no. 3163, 4.12.1911 (SYD): Clarence-Wolgan, J. H. Maiden, 11.1906 (NSW 75586): Medlow, A. A. Hamilton, 3.1903 (NSW 75587): Blackheath, O. D. Evans, 1.1932 (SYD): Cooleman Plain, Currango, Walker, no. ANU953, Dec. 1962 (CANB 122232): Daner's Gap, Kosciusko, M. Gray, no. 0093, 1.1959 (CANB 61276): Braidwood District, W. Bäuerlen, no. 214, Dec. 1884 (MEL 9759): *Australian Capital Territory*: Coree Flats, P. Darbyshire, no. 139, 1 Feb. 1961 (CANB 89548.K). *Victoria*: Mt. Buffalo, T. B. Muir, no. 643, 1.1.1959 (MEL 9756): Lost Plain, Mt. Wellington, T. B. Muir, no. 3751, 14.1.1965 (MEL 9755). *Tasmania*: South Esk near Evandale, F. Mueller, 1849 (MEL 9744. NSW 75600): Middlesex Plains, C. S. Sutton, Jan. 1909 (MEL 9743): Great Lake, E. R. Rodway, 26.12.1937 (NSW 75598): Lake Leake, R. Melville, no. 2536, 19.12.1952 (NSW 75591.K) Lake St. Clair, L. S. Gibbs, no. 6500 (K.BM): Near Evandale, W. H. Archer, no. 141 (NSW 75595).

#### EXCLUDED SPECIES

1. *V. lanceolata* Lindl. in Swan River. App. Bot. Reg., 26 (1839) = *Goodenia filiformis* var. *pulchella* Benth.
2. *V. macroplectra* F. Muell. Fragm., 12: 22 (1882) = *Symphobasis macroplectra* (F. Muell.) Krause. This species appears to be a *Goodenia*.
3. *V. salmoniana* F. Muell. in Vict. Nat., 9: 127 (1892) et in Bot. Centr., 53: 124 (1893). A *Goodenia* species.
4. *V. cusackiana* F. Muell. in Vict. Nat., 12: 124 (1896): Krause in Pflrch., 54: 38 (1912). A *Goodenia* species.
5. *V. dichotoma* auct. ex DC. Prodr., 7: 519 (1839), nom. nud.
6. *E. filiformis* De Vriese in Lehm., Pl. Preiss., 1: 414 (1844) et Gooden., 171 (1854). The type, Preiss no. 1889 (L) is a specimen of *Stellaria filiformis* (Benth.) Mattf. see Kern in Blumea, 13: 116 (1965).

pubescent in the throat: tube 4–5 mm. long: superior lobes oblong-elliptic, 2 mm. long, 1 mm. wide with wings about 0.5 mm. long but the auricle almost obsolete: inferior lobes oblong-elliptic, 2 mm. long, 1 mm. wide with conspicuous wings about 0.5 mm. long: connate part of inferior lobes 1 mm. long or less. *Stamens* 5: filaments, linear to filiform, c. 2 mm. long; anthers ovate, 1 mm. long, apiculate. *Ovary* ovoid, minutely pubescent to almost glabrous with a dissepiment reaching to about the mid-mark bearing up to 20 ovules: style about 1 mm. long with a few villous hairs: indusium depressed-ovate, c. 1 mm. across, slightly folded and curved with a slightly curved orifice beset with very short cilia. *Capsule* sub-globular, c. 2 mm. diam. with a few hairs sprinkled over the outer surface,  $\pm$  equally 4-valved. *Seeds* flat, orbicular to elliptic, c. 1.5 mm. diam., very minutely punctulate with an obscure rim.

*Range*: Tasmania and eastern mainland at high altitudes as far north as Barrington Tops.

*Habitat*: Alpine grassland and savannahs in damper places.

*Chromosome number*:  $n = 8$ .

*Typification*: Hooker cites three localities. Labels (and presumably specimens) corresponding to these localities are all affixed to the same sheet at K. The bottom three are selected as the *Lectotype*—Hampshire Hills. Gunn, no. 227, Feb. 1837 (K). N.B. The same number is applied to the Marlborough collection made in 1841 and to an Arthur's Lake collection in 1845, both made by Gunn.

*Discussion*: A very distinct species but very variable with regard to the indumentum. The Tasmanian specimens tend to have narrower sepals and are more glabrous altogether but these are not consistent differences.

*Selected specimens examined*: *New South Wales*: Barrington Tops L. R. Fraser, J. W. Vickery and N. A. Burgess, 7.1.1934 (SYD): Happy Jacks Plain, R. Carolin, no. B99, 10.2.1957 (SYD): Mt. Werong, R. H. Cambage, no. 3163, 4.12.1911 (SYD): Clarence-Wolgan, J. H. Maiden, 11.1906 (NSW 75586): Medlow, A. A. Hamilton, 3.1903 (NSW 75587): Blackheath, O. D. Evans, 1.1932 (SYD): Cooleman Plain, Currango, Walker, no. ANU953, Dec. 1962 (CANB 122232): Daner's Gap, Kosciusko, M. Gray, no. 0093, 1.1959 (CANB 61276): Braidwood District, W. Bäuerlen, no. 214, Dec. 1884 (MEL 9759): *Australian Capital Territory*: Coree Flats, P. Darbyshire, no. 139, 1 Feb. 1961 (CANB 89548.K). *Victoria*: Mt. Buffalo, T. B. Muir, no. 643, 1.1.1959 (MEL 9756): Lost Plain, Mt. Wellington, T. B. Muir, no. 3751, 14.1.1965 (MEL 9755). *Tasmania*: South Esk near Evandale, F. Mueller, 1849 (MEL 9744. NSW 75600): Middlesex Plains, C. S. Sutton, Jan. 1909 (MEL 9743): Great Lake, E. R. Rodway, 26.12.1937 (NSW 75598): Lake Leake, R. Melville, no. 2536, 19.12.1952 (NSW 75591.K) Lake St. Clair, L. S. Gibbs, no. 6500 (K.BM): Near Evandale, W. H. Archer, no. 141 (NSW 75595).

#### EXCLUDED SPECIES

1. *V. lanceolata* Lindl. in Swan River. App. Bot. Reg., 26 (1839) = *Goodenia filiformis* var. *pulchella* Benth.
2. *V. macroplectra* F. Muell. Fragm., 12: 22 (1882) = *Symphobasis macroplectra* (F. Muell.) Krause. This species appears to be a *Goodenia*.
3. *V. salmoniana* F. Muell. in Vict. Nat., 9: 127 (1892) et in Bot. Centr., 53: 124 (1893). A *Goodenia* species.
4. *V. cusackiana* F. Muell. in Vict. Nat., 12: 124 (1896): Krause in Pflrch., 54: 38 (1912). A *Goodenia* species.
5. *V. dichotoma* auct. ex DC. Prodr., 7: 519 (1839), nom. nud.
6. *E. filiformis* De Vriese in Lehm., Pl. Preiss., 1: 414 (1844) et Gooden., 171 (1854). The type, Preiss no. 1889 (L) is a specimen of *Stellaria filiformis* (Benth.) Mattf. see Kern in Blumea, 13: 116 (1965).



## Key to the Species

1. Sepals 5.
  2. Calyx united into a tube at least as long as the shortest lobes.
    3. Stem short and leaves therefore basal: calyx segments  $\pm$  equal ..... 1. *V. trinervis*
    - \*3. Stem elongated.
      4. Leaves sessile, crowded ..... 2. *V. foliosa*
      - \*4. Leaves narrowing gradually into a distinct petiole .... 3. *V. macrophylla*
  - \*2. Sepals quite free or connate only towards the base.
    5. Bracteoles connate.
      6. Sepals almost completely free ..... 5. *V. panduriformis*
      - \*6. Sepals connate into a short tube 2-4 mm. long
        7. Sepals broad-ovate to ovate: seeds  $\pm$  smooth ..... 6. *V. connata*
        - \*7. Sepals narrow-ovate: seeds papillose ..... 7. *V. discophora*
    - \*5. Bracteoles free or nearly so.
      8. Corolla lilac, white or pink.
        9. Corolla up to 7 mm. long ..... 9. *V. cynopotamica*
        - \*9. Corolla more than 10 mm. long.
          10. Seeds smooth; auricle attached to wing .... 4. *V. daviesii*
          - \*10. Seeds wrinkled; auricle with a membranous appendage separated from the wing ..... 8. *V. rosea*
      - \*8. Corolla yellow.
        11. Corolla up to 8 mm. long ..... 10. *V. hispida*
        - \*11. Corolla more than 10 mm. long.
          12. Lobes of the corolla  $\pm$  equal (connate part of inferior lobes 2-3.5 mm. long); indusium narrow-oblong .... 11. *V. arguta*
          - \*12. Lobes of the corolla distinctly unequal; indusium broad-ovate to depressed-ovate.
            13. Peduncles pubescent; indusium broad-ovate ..... 12. *V. paradoxa*
            - \*13. Peduncles glabrous or nearly so; indusium depressed-ovate ..... 13. *V. glabrata*
  - \*1. Sepals 3.
    14. Bracteoles connate ..... 19. *V. perfoliata*
    - \*14. Bracteoles free.
      15. Corolla lobes  $\pm$  equal; peduncles usually shorter than the leaves ..... 20. *V. montana*
      - \*15. Corolla lobes distinctly unequal; peduncles usually longer than the leaves.
        16. Peduncles glabrous or glabrescent.
          17. Posterior sepal distinctly cordate; bracts narrow. .... 14. *V. lyrata*
          - \*17. Posterior sepal not distinctly cordate.
            18. Peduncles ascending to decumbent; ovary dissepiment reaching the mid-mark of the ovary ..... 18. *V. macrocalyx*
            - \*18. Peduncles erect: ovary dissepiment very short ..... 15. *V. parvisepata*
        - \*16. Peduncles pubescent.
          19. Peduncle hairs coarse, appressed ..... 16. *V. spathulata*
          - \*19. Peduncle hairs divergent or patent ..... 17. *V. pubescens*

## References

- CAROLIN, R. C., 1967.—The concept of the inflorescence in the order Campanulales. Proc. LINN. SOC. N.S.W., 92: 7-26.
- KRAUSE, K., 1912.—Goodeniaceae und Brunoniaceae. *Das Pflrch.*, 54 (Berlin).
- PEACOCK, W. H., 1963.—Chromosome numbers and cytoevolution in the Goodeniaceae. Proc. LINN. SOC. N.S.W., 88: 8-27.
- TROLL, W., 1964.—"Die Infloreszenzen". (Jena.)

## EXPLANATION OF PLATES

Plate I. Photographs of seeds of *Velleia*. A, *V. trinervis*; B, *V. foliosa*; C, *V. macrophylla*; D, *V. daviesii*; E, *V. panduriformis*; F, *V. discophora*; G, *V. connata*; H, *V. cynopotamica*; I, *V. rosea*.

Plate II. Photographs of seeds of *Velleia*. A, *V. glabrata*; B, *V. paradoxa*; C, *V. arguta*; D, *V. hispida*; E, *V. spathulata*; F, *V. lyrata*; G, *V. perfoliata*; H, *V. pubescens*; I, *V. parvisepata*; J, *V. montana*.

## Key to the Species

1. Sepals 5.
  2. Calyx united into a tube at least as long as the shortest lobes.
    3. Stem short and leaves therefore basal: calyx segments  $\pm$  equal ..... 1. *V. trinervis*
    - \*3. Stem elongated.
      4. Leaves sessile, crowded ..... 2. *V. foliosa*
      - \*4. Leaves narrowing gradually into a distinct petiole .... 3. *V. macrophylla*
  - \*2. Sepals quite free or connate only towards the base.
    5. Bracteoles connate.
      6. Sepals almost completely free ..... 5. *V. panduriformis*
      - \*6. Sepals connate into a short tube 2-4 mm. long
        7. Sepals broad-ovate to ovate: seeds  $\pm$  smooth ..... 6. *V. connata*
        - \*7. Sepals narrow-ovate: seeds papillose ..... 7. *V. discophora*
    - \*5. Bracteoles free or nearly so.
      8. Corolla lilac, white or pink.
        9. Corolla up to 7 mm. long ..... 9. *V. cynopotamica*
        - \*9. Corolla more than 10 mm. long.
          10. Seeds smooth; auricle attached to wing .... 4. *V. daviesii*
          - \*10. Seeds wrinkled; auricle with a membranous appendage separated from the wing ..... 8. *V. rosea*
      - \*8. Corolla yellow.
        11. Corolla up to 8 mm. long ..... 10. *V. hispida*
        - \*11. Corolla more than 10 mm. long.
          12. Lobes of the corolla  $\pm$  equal (connate part of inferior lobes 2-3.5 mm. long); indusium narrow-oblong .... 11. *V. arguta*
          - \*12. Lobes of the corolla distinctly unequal; indusium broad-ovate to depressed-ovate.
            13. Peduncles pubescent; indusium broad-ovate ..... 12. *V. paradoxa*
            - \*13. Peduncles glabrous or nearly so; indusium depressed-ovate ..... 13. *V. glabrata*
  - \*1. Sepals 3.
    14. Bracteoles connate ..... 19. *V. perfoliata*
    - \*14. Bracteoles free.
      15. Corolla lobes  $\pm$  equal; peduncles usually shorter than the leaves ..... 20. *V. montana*
      - \*15. Corolla lobes distinctly unequal; peduncles usually longer than the leaves.
        16. Peduncles glabrous or glabrescent.
          17. Posterior sepal distinctly cordate; bracts narrow. .... 14. *V. lyrata*
          - \*17. Posterior sepal not distinctly cordate.
            18. Peduncles ascending to decumbent; ovary dissepiment reaching the mid-mark of the ovary ..... 18. *V. macrocalyx*
            - \*18. Peduncles erect: ovary dissepiment very short ..... 15. *V. parvisepata*
        - \*16. Peduncles pubescent.
          19. Peduncle hairs coarse, appressed ..... 16. *V. spathulata*
          - \*19. Peduncle hairs divergent or patent ..... 17. *V. pubescens*

## References

- CAROLIN, R. C., 1967.—The concept of the inflorescence in the order Campanulales. Proc. LINN. SOC. N.S.W., 92: 7-26.
- KRAUSE, K., 1912.—Goodeniaceae und Brunoniaceae. *Das Pflrch.*, 54 (Berlin).
- PEACOCK, W. H., 1963.—Chromosome numbers and cytoevolution in the Goodeniaceae. Proc. LINN. SOC. N.S.W., 88: 8-27.
- TROLL, W., 1964.—"Die Infloreszenzen". (Jena.)

## EXPLANATION OF PLATES

Plate I. Photographs of seeds of *Velleia*. A, *V. trinervis*; B, *V. foliosa*; C, *V. macrophylla*; D, *V. daviesii*; E, *V. panduriformis*; F, *V. discophora*; G, *V. connata*; H, *V. cynopotamica*; I, *V. rosea*.

Plate II. Photographs of seeds of *Velleia*. A, *V. glabrata*; B, *V. paradoxa*; C, *V. arguta*; D, *V. hispida*; E, *V. spathulata*; F, *V. lyrata*; G, *V. perfoliata*; H, *V. pubescens*; I, *V. parvisepata*; J, *V. montana*.